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## Foreign Direct Investment Policies and Catching-Up

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### Abstract:

The dynamic effects of Foreign Direct Investment in Portugal allowed for a structural shift in exports towards technology-intensive activities. However, since 2000, several factors, largely triggered by the global financial crisis, led to a drop in industrial output along with a reduction in FDI attraction. This paper assesses the efficacy of the Investment Promoting policies to stimulate innovation and promote the absorptive capacity at national level, by analysing the relationship between FDI inward flows and a set of innovation and absorptive capacity indicators. Results show that the gap between Portugal and the EU-28 average is far from being closed. Rather than being an automatic process triggered by foreign presence, we suggest that the convergence based on the productivity, can be assisted by a reinforcement of supply-side measures, and the coordination between the industrial policy and the instruments of the Investment Promotion Policy, in strategic industries.

**Keywords:** industrial policy; productivity; investment promotion policies; innovation; convergence; technological gap

**JEL Classification:** F15; F23; O11; O33; O40

### Introduction

After World War II, the Portuguese economy started a process of industrialization, first based on an import substitution policy, which was followed in the 1960s by export promotion policies along with an increasing openness to international trade. Industrialization supported by public and private investments accelerated convergence to the technological frontier. However, being a moderately innovative economy (Innovation Union Scoreboard 2011), without the location advantages of the CEECs, the potential of convergence of the Portuguese economy, since 2005, was largely threatened by an average growth rate of Total Factor Productivity (TFP) of only 0.28% in 2005-2010.

FDI can improve the innovative and the absorptive capacity of domestic manufacturing firms and, thus, it is a vehicle of technological change. Bearing this in mind, we analyse the evolution of FDI and several indicators related to the innovative capability and the absorptive capacity; and we perform an analysis of the performance of the Portuguese economy regarding the achievement of goals to reduce the gap (technological plan) and to increase the innovative capability and the absorptive capacity (Europe 2020 strategy). The objective of this exercise is to provide some policy recommendations to boost productivity and prompt economic growth.

The paper is organized as follows. Section 2 describes the legal framework and the Public Investment Policy related to FDI in Portugal; Section 3 analyses the evolution of FDI inward flows in Portugal and the Manufacturing performance, as well as a set of indicators of technological change in order to assess the efficacy of FDI policies to promote innovation and its coordination with measures aiming to promote the absorptive capacity; In Section 4 we make some recommendations on the design and implementation of FDI policies in the Industrial context; finally, Section 5 concludes.

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## 1. Foreign Direct Investment Policies in Portugal

The economic benefits from attracting FDI are generally positive externalities to the host economy. The channels through which externalities operate are: 1) technology transfer and know-how; 2) firm development and restructuring (in relation with privatizations); 3) integration in international trade; 4) enhanced competition; 5) support for training human capital in the host country (Mercinger 2003).

In developed countries, the first two channels are generally considered the most important ones (OECD 2002). Policies to attract foreign investors include low tax corporate rates, reducing bureaucracy, preferential tariff arrangements, stepped-up investment in infrastructure and education measures. Many of the tariff arrangements, infrastructure and education measures have been directed to priority economic sectors and regions (in connection with “special economic zones”, “export processing zones”, etc.). Other measures were aimed at the general strengthening of social capital through subsidies to the final investment. But these strategies cannot be classified as FDI incentives because they encourage private investment in general, whereas FDI incentives target or give preferential treatment to foreign investors.

### 1.1. Legal Framework

Portugal's accession to the EC was the engine of change in existent foreign investment legislation from 24 August 1977. Indeed, the new legal mechanism was necessary to liberalize the transfer of private capital (in the form of FDI) from the EC countries and non-EU countries. Under the new regime, enshrined in the diplomas of July and August 1986, all economic sectors are open to private investment, regardless of their origin. The 1977 system, which followed the lengthy procedures, was replaced by a prior notification system based on the following characteristics. Before starting operations, the foreign investor should send the investment proposal to the competent national authority; within two months, the authority informs the applicant of its decision; failure to notify the applicant within that period gives the right to start operations immediately. This system was intended to create new jobs, attract foreign currency to reduce the Portuguese external indebtedness and to strengthen the regional development programs. These objectives were reinforced with entry into force in 1995, of the Foreign Investment Code, under which non-resident firms can create and exercise any economic activity allowed to private sector.<sup>3</sup> It also ensured non-discrimination between domestic and foreign investors. Investors could request state aid for an investment project under a general incentive scheme or under a special contractual regime of foreign investment, in case of involving a certain amount of capital expenditures.

The Decree No. 2/96 of 16 May 1996, as amended by Decree No. 4/00 of 24 March 2000 establishes the procedures for submitting such a request; and Ordinance No. 865-A/ 2002 has established the minimum amount of capital associated with the eligible investment: EUR 25 million. Investment projects under this scheme could benefit from financial incentives under operational programs and special tax incentives (in accordance with the Tax Benefits -Article 49a and Decree-Law No. 409/99 of 15 October 1999). Law No. 44/2014, of 11 July, authorized the government to amend the Tax Benefits Statute and to adopt a new Tax Code of the investment that has adapted the European legislative framework for state aid for 2014-2020. This code aims to strengthen the tax-exempt investment schemes, about investments that aim to create or maintain jobs and which are in less-favoured regions. About the contractual tax benefits, the limit of corporate tax credit is extended as well as the credit increases for investments in regions with a per capita purchasing power significantly below the national average, which provide the creation or maintenance of employment or contribute to technological innovation or environmental protection. In November 2014, the Council of Ministers reviewed the contractual arrangements for investment, special procurement system (RCI) incentives applicable to large classifiable investment projects within the jurisdiction of the Portuguese Agency for Investment and Foreign Trade (henceforth AICEP). The RCI allows a special negotiation treatment for these projects and the contracting of a set of incentives. The nature, amount and conditions of the incentives- financial incentives, tax benefits and specific compensatory measures to mitigate the costs - are determined considering the economic impacts of the project, as well as the fulfilment of obligations by the sponsor and the contractually fixed economic targets, through a process led by AICEP mandated by the Government.

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<sup>3</sup> Decree-Law No. 321/95 of 28 November 1995

## 1.2. Public Investment Policy

According to Law 82-A/2014 which approved the major plan options for 2015, Portugal has implemented a program of structural reforms, aimed to reinforce the dynamism and flexibility of the economy, creating international competitive benefits and the sustainability of the public sector. To attract foreign investment, the areas of public intervention are based on the transparency of public finances, the flexibility of labour market, the speed of court proceedings and liberalization in product markets. In addition, measures have been taken to simplify administrative requirements, to restructure operations and to promote business and to strengthen the management and rationalization skills of bank funds directed to small and medium enterprises (SMEs). In October 2014, the EC approved the establishment of the Financial Development Institute which, as its counterparts in other European countries, channels the structural funds. This institution focuses on three areas of intervention with the purpose of promoting economic growth and employment, supporting competitiveness and international presence; and contributing to sustainable development. In the field of innovation, measures were implemented to stimulate business innovation, strengthen the cooperation between firms and scientific and technological organizations and promote the inclusion of doctorates and masters in firms through financial incentives to SMEs. Aimed at creating a favourable environment for entrepreneurship, it was created the new special visa regime for knowledge intensive start-ups based in Portugal. Moreover, the incentives to promote business angels and venture capital have been strengthened, with financial support mechanisms and corporate tax incentives for start-ups.

The Industrial Development Strategy for Growth and Employment and The Competitiveness Agenda for Trade, Services and Restaurants 2014-2020 were designed to jointly cover all sectors, create employment and growth opportunities. In this context, fiscal policy is a key instrument in supporting investment, promoting sustainable growth, creating employment and strengthening the capital structure of firms. In 2014, with the aim of turning competitive the country's tax system, the government reformed the corporate Tax (IRC), which included a reduction of tax rates, and approved the new Investment Tax Code. To fight fraud and tax evasion, it was designed the Cash Value Added Tax system that allows the adjustment of loans overdue in more than 24 months from the date of maturity without prior judicial decision. Attention was also paid to the conventions to avoid double taxation, with other European countries, and the negotiations take place with about 40 countries. With the objective of creating a more favourable environment for investment, the government adopted a consolidation and revitalization of the business strategy based on: the simplification of administrative requirements for restructuring operations; development of business promotion actions; creation of business opportunity grants; mergers encouragement; enhance business management skills; and banking capitalization funds for SMEs.<sup>4</sup> At the same time, the creation of a multi-annual training program for new exporters led to the signing of international protocols for the release of intermediated credit lines and guarantees for the financing needed to support the internationalization of SMEs. In the context of this paper it is assumed that the policies and instruments described have been, to some extent, successful in attracting FDI and, indirectly, increase the TFP of domestic manufacturing firms.<sup>5</sup> Furthermore, international empirical studies provide evidence that FDI can improve the innovative capacity of the domestic firms. Though, the magnitude of the effect of FDI on innovation capacity may depend on the absorptive capacity of domestic firms (Fu 2008).

## 2. Foreign Direct Investment Flows to Manufacturing, Technological Change and Convergence

For the follower economy, the process of catching-up with high-income economies consists in eliminating the productivity gap. Since the convergence process is partly driven by the convergence of TFP with the technological leader economy, identifying the drivers of productivity growth is crucial to understand the sources of the productivity gap.

FDI is believed to generate positive externalities in the form of knowledge spillovers to the domestic economy through, for instance, linkages with local suppliers and clients (backward and forward linkages), learning from nearby foreign firms and employee training programmes. In this context, the manufacturing sector, being a

<sup>4</sup> Government provided funds aimed at the fulfillment of capital ratios by banks at a certain level of interest rate and with the guarantee that banks will lend at least part of these funds to SMEs.

<sup>5</sup> Tavares-Lehman (2007) remarks that, although in recent years, Portuguese policy regarding FDI has evolved towards a more proactive and selective stance, the institutional agenda is not prone to maximize the potential benefits of existing investments and macro policies lack consistency. Also, Vinhas de Souza (1996) tested the effects of the regulatory structure upon the amount of the FDI flows to Portugal but the coefficients were not significant, and the author could not find a clear sign of granger-causality between legal liberalization and tax policy and the size of the inflows, for 1985-1994. As a result, as Silva (1990) -notes, except for some years in the 1980s, Portugal has never attracted a large amount of FDI flows.



major producer of tradables, is the main engine of economic growth due to its higher productivity and innovation indices (Andreoni and Gregory 2013). Furthermore, technological linkages stemming from manufacturing industries are main vehicles of technological change (Jones and Olken 2005, Rodrik 2007 and Su and Yao 2016).

An increased foreign presence within an industry is correlated with the TFP growth of domestic firms through increased speed of technology transfer. Table 1 shows some quantitative results regarding the effect of FDI in the TFP of the manufacturing firms in the host economy.

Table 1. Impact of FDI on the TFP of manufacturing firms

Author	FDI Measure	TFP increase (%)
Keller and Yeaple 2009	Share of foreign-affiliates' employment	1.100
Pessoa 2005*	Net annual inflows	0.019 -0.023
Haskel <i>et al.</i> 2007	Share of foreign-affiliates' employment	0.050
Fons Rosen <i>et al.</i> 2013*	Share of foreign capital of firms	0.008
Santos and Khan 2018	Turnover	0.42

Notes: \*Cross-section studies, including Portugal

For example, Keller and Yeaple (2009) estimate that, in 1987 - 1996, a 1% increase in the share of foreign-affiliates' employment in total employment, increases TFP of manufacturing plants in the US by 1.1%. For a panel of OECD Countries, including Portugal, Pessoa (2005) estimates that 1% increase in FDI have an impact on the TFP of manufacturing firms of about 0.019% – 0.023% in 1985 - 2002. Using plant level panel data for the UK, Haskel *et al.* (2007) find that a 1% increase in the share of MNCs in total employment raised the TFP of that industry by 0.05% in 1973-1992. Another study using panel data at firm-level (Fons-Rosen *et al.* 2013) analyses the impact of FDI in the TFP of manufacturing firms for a set of developed countries, including Portugal, and concludes that the impact is 0.007% in the 1999-2008 period. Finally, Santos and Khan (2018), using a dynamic panel data of manufacturing firms, for 1995-2007, estimate that 1% increase in the turnover of foreign firms raises the TFP in 0.42 percentage points.

FDI is one of the main potential sources of externalities to Portugal (EC 2016). For example, in the period 1985-1995 there was a stronger contribution of TFP to economic growth, in part associated with FDI inflows financed by EU Structural Funds (Amador and Coimbra 2007). Indeed, after 1988 there was a burst in FDI flows which increased the capital stock of about 4.2%, adding about 0.31% to GDP growth, per year (Mateus 2006). Freitas and Mamede (2008) found that the share of foreign firms in 2005 was higher than average for products with "High" and "Very High" income content (56% and 43%, respectively); while Gonçalves and Martins (2016), using panel data for Portuguese manufacturing firms, for 2010-2014, found that exports prompted the TFP growth.

Hence, the sustained growth of the economy will depend largely on the ability of economic agents to diversify financing sources, including by attracting FDI (Júlio *et al.* 2013). Hence, we assume that FDI inflows may be a channel of technological catching-up, and perform an analysis of correlation between changes in FDI inward flows and in the manufacturing performance and in the aggregate productivity in order to provide a hint on the impact of FDI on the productivity and economic growth<sup>6</sup>. Bearing this in mind, we start by analysing the evolution of FDI inflows and the manufacturing performance. Subsequently we analyse the evolution of a set of indicators related to the innovation system in the Portuguese economy.

Finally, we scrutinize the sources of the technological gap and the goals of the Technological Plan, which aim to narrow the gap. Our analysis on the dynamics of Portuguese innovation systems draw from Schumpeterian literature on innovation and economic growth. The importance of innovation capability for the economic growth arise from the idea-based new growth models (Romer 1990, Furman *et al.* 2002); whereas the role of absorptive capacity for imitation-based catching-up is highlighted in the technology-gap models (Abramovitz 1986, Verspagen 1991, Godinho *et al.* 2006, Fagerberg and Srholec 2008). This exercise aims to gauge whether convergence is being triggered.

<sup>6</sup> Our analysis does not consider technical transfer via FDI that occurs in Services sector.

## 2.1. Foreign Direct Investment Inward Flows

Portugal's accession to the EEC has indirectly contributed to the boost of inflows of foreign capital, which in 1986 accounted for 15% of GDP and 3.3% of total world FDI. Nevertheless, in 1986, FDI inflows represented only 4% of GDP and 0.5% of global FDI; whereas in 2016 it represented only 1% of GDP. After 2008, FDI flows have stabilized around 1% of GDP. However, in the period 2011-2015 FDI flows increased to 2% of GDP, due to privatizations carried out in the context of the Economic and Financial Assistance Programme (EFAP). As for the evolution of FDI stocks, it confirms the increasingly importance of foreign subsidiaries in Portugal. In 2016, FDI stocks represented 28% of GDP, 3.5 times more than in 1986.

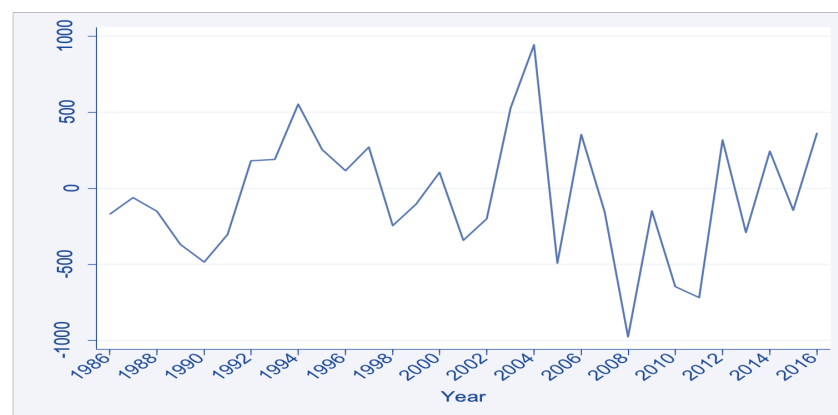
Table 2. Flows and stocks of FDI (% GDP), Portugal (1986-2016)

Year	Flows	Stocks	Year	Flows	Stocks
1986	4	8	2002	1	19
1987	9	16	2003	3	22
1988	-2	12	2004	1	22
1989	7	18	2005	1	22
1990	2	17	2006	4	25
1991	2	17	2007	1	25
1992	1	17	2008	1	25
1993	1	18	2009	0	25
1994	1	17	2010	1	24
1995	0	16	2011	2	26
1996	1	16	2012	2	27
1997	1	16	2013	1	27
1998	2	16	2014	2	28
1999	1	16	2015	2	29
2000	3	18	2016	1	28
2001	3	19	Average	2	20

Source: author's calculations based in UNCTAD.

Table 3 shows FDI inflows by EU Country. In 1993, Portugal was in the ninth position. However, the Country dropped to 15th position in 2013, being surpassed by Poland, Czech Republic and Hungary. Indeed, with the acceleration of globalization that started in the new millennium, FDI flows targeting the Portuguese manufacturing sector became more volatile.

Figure 1. Net FDI flows to Manufacturing (USD million), Portugal (1986-2016)



Source: Author's calculations based in OECD Stat.

Bearing this in mind, we analyse the joint evolution of FDI flows to the manufacturing sector and the factor contribution (%) to GVA increase in the manufacturing sector from 1986 to 2016, in search for a hint regarding the role of FDI to TFP increase in the manufacturing sector.



Table 3. FDI inflows (USD Million) to EU Countries (1986-2016)

Country	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Austria	4989	6648	6816	9208	10972	11511	12040	12106	14804	19720	19629	19522	23564	23471	30431	34329
Belgium	-521090	-181084	-294553	97389	-138324	-227052	-206200	-204039	-82242	-18504	-18233	-17279	-20766	-20362	-23492	-26347
Bulgaria	1032	-2633	904	108	112	168	210	250	355	445	554	1059	1597	2184	2704	2945
Cyprus	-1113	-1061	-999	-929	-802	-720	-613	-530	-454	-79	350	897	1242	2055	2910	3855
C.Repub	0	0	1291	1291	1363	1886	2889	3423	4547	7350	8572	9234	14375	17552	21644	27092
Denmark	4591	5629	5485	6905	9192	14712	14387	14618	18083	23801	22340	22268	35694	47643	73574	75438
Estonia	731	534	657	846	-603	14	96	258	473	674	825	1148	1822	2467	2645	3160
Finland	1680	2620	3040	3965	5132	4220	3689	4217	6714	8465	8797	9530	16455	18320	24273	24070
France	44465	49084	56287	69348	97814	110174	127883	135078	163447	191434	200156	195864	246214	244668	259775	295323
German	49277	64714	61526	84218	111231	123992	119965	116134	139154	165914	162514	158832	206776	235259	271611	272153
Greece	9071	10136	11632	13011	5681	6816	7960	8937	9918	10971	12029	13013	13084	15890	14113	13941
Hungary	10959	9786	9446	12942	570	2107	3424	5576	7087	11304	13282	17968	20733	23260	22870	27407
Ireland	36594	36917	37174	37367	37989	39351	40809	41887	42744	44187	46804	48940	62450	72815	127089	134052
Italy	25554	31353	36884	49391	59998	61576	49963	53949	60376	65350	74640	85468	108822	108638	121170	113435
Latvia	2298	722	1084	1778	343	145	176	221	436	615	936	1272	1558	1795	2084	2328
Lithuania	-607	-657	-193	-784	-26	97	107	137	321	352	700	1041	1625	2063	2334	2665
Luxemb	56320	107627	-91839	108488	-27533	-64537	-82537	-107994	5423	18504	18233	17279	20766	20362	23492	26347
Malta	308	327	368	420	465	542	582	651	416	562	844	858	1174	1872	2385	2551
Netherla	33354	43449	42546	52052	68731	72475	74440	74478	93409	116049	126543	122193	164473	192228	243733	282882
Poland	102732	39358	-1901	-37393	109	425	1370	2307	3789	7843	11463	14587	22461	26075	34227	41247
Portugal	4354	4870	5861	7670	10571	13020	14893	16427	17697	18982	21118	22392	30088	26910	32044	36023
Romania	0	0	0	0	0	44	122	215	402	821	1097	2417	4527	5671	6951	8339
Slovakia	17982	13295	-2394	189	282	363	463	642	897	1297	2046	2103	2920	3188	4746	5582
Slovenia	5804	3622	1636	1639	1643	1708	1819	1931	2048	2617	2730	2207	2777	2682	2893	2594
Spain	13436	22992	29578	41951	65916	79571	107840	100299	93148	104521	119766	105296	126059	125361	156348	177254
Sweden	6013	9234	9907	10920	12636	18085	14057	13127	22650	31043	34835	41454	51002	73301	93995	91942
U.K	76283	109352	129654	150201	203905	208346	172986	179233	189588	199772	228643	252959	337386	385146	438631	506686

Table 3. FDI inflows (USD Million) to EU Countries (1986-2016) (cont.)

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Austria	43508	53844	62336	69454	84025	126895	145796	169124	160615	152768	164714	178825	176607	164785	107110
Belgium	229513	351499	466548	478183	633296	748110	854426	967601	873315	942817	512712	571776	476405	468710	421839
Bulgaria	4074	6371	10108	13851	22867	36508	27846	32829	31510	28179	29633	29855	29660	26375	17408
Cyprus	4912	6728	8594	8688	14577	18414	180043	186227	212576	182687	185190	177461	149440	138263	95401
C.Republic	38669	45287	57259	60662	79841	101074	113174	125827	128504	120569	136493	134085	121512	113057	83662
Denmark	82799	100191	116486	115953	135408	146632	103957	103197	96984	98406	98302	94482	97216	100858	73626
Estonia	4226	7002	10064	11290	12664	16594	15449	15841	15551	16350	18937	21202	19712	18914	14942
Finland	33987	50257	57376	54585	67991	85237	83534	85163	86698	89232	96641	88762	93901	92340	65561
France	385202	527624	641807	628075	771545	1026081	563005	648012	630710	698871	717328	796488	729147	772030	594463
Germany	297785	394513	512066	475996	578786	629711	789256	963511	955881	997727	1077019	1088690	1089569	1121289	818541
Greece	15561	22454	28482	29189	41288	52838	38119	42097	35026	29060	24765	25850	22534	17688	12205
Hungary	36224	48340	62585	61970	81586	97397	88054	98876	90845	85331	104017	108517	98885	92132	63571
Ireland	182897	222960	204819	163530	156593	187184	188290	250103	285575	290495	364607	392915	378202	435490	431135
Italy	130819	180891	220720	224079	294876	364839	327911	364427	328059	355127	375029	364959	346824	335335	224674
Latvia	2751	3277	4529	4929	7476	10493	11309	11629	10935	12111	13534	15956	14668	14549	9893
Lithuania	3981	4960	6389	8211	10996	14679	12949	13216	13271	14266	15966	17542	15619	14440	9242
Luxembourg	34972	41730	49733	43721	66658	30176	125128	172217	172257	225725	167222	91396	180434	205029	135319
Malta	2413	3281	4018	4315	6498	7457	117077	125193	129770	146146	165530	184584	173838	163522	112830
Netherlands	349969	426611	477219	451078	502226	673430	647414	646292	588078	610677	628187	770976	715706	707043	445437
Poland	48320	57877	86623	90711	124530	142110	148417	167399	187602	164424	198953	229167	205581	213071	144888
Portugal	44637	60585	66970	63339	87959	114192	105511	118299	114994	103761	114573	124623	118918	114220	62821
Romania	7846	12202	20486	25817	45452	60921	64759	69883	68093	69513	76329	82688	73086	69112	46996
Slovakia	8530	14576	20910	23656	38335	40702	50416	52537	50328	51980	55124	58021	52488	48163	34196
Slovenia	4112	6308	7590	7259	8924	10350	11966	11277	10667	11490	12203	12269	12299	11847	7700
Spain	257106	339652	395984	370943	441039	537455	588901	632246	628341	628950	644677	638982	591709	533306	383980
Sweden	119368	158884	196290	171768	226385	254459	278802	332150	347163	349058	373444	386105	311786	281876	205770
U.Kingdom	523320	606158	701913	850963	1133437	1347688	901515	1015805	1057188	1145720	1428059	1489940	1744230	1457408	932741

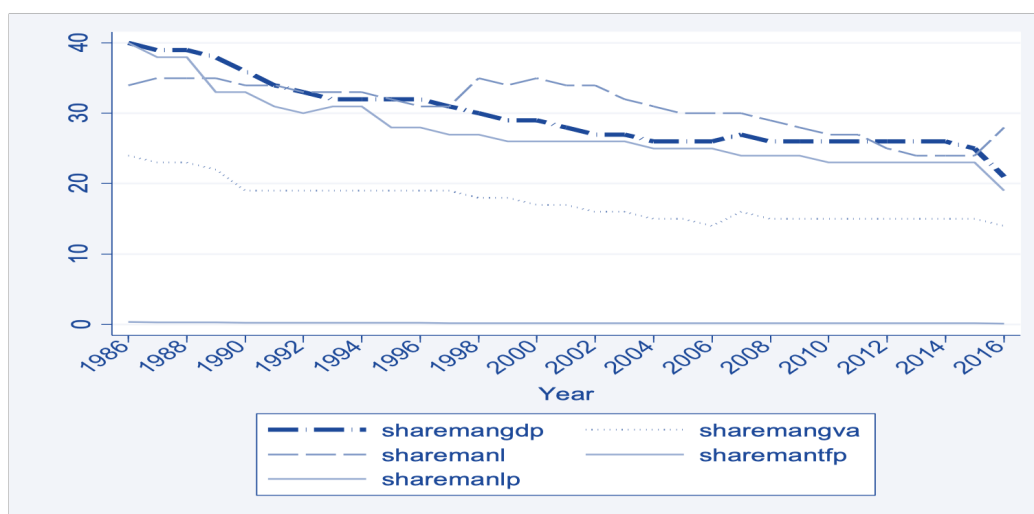
Source: UNCTAD

## 2.2. Foreign Direct Investments and the Manufacturing performance

In what follows we analyse, on the one hand, the evolution of net FDI flows targeting the manufacturing sector in 1986-2016, and its performance regarding output, value added and productivity; and, on the other hand, the contribution of the subsidiaries in the manufacturing sector in Portugal, by technological groups, concerning high technology exports and growth accounting, in the same period.

Through the joint analysis of Figures 2 and 3 on the evolution of net FDI flows targeting the manufacturing sector and the performance of this sector, we can observe a tendency in which the peaks of 1994, 2004, 2006 and 2012 correspond to years in which the contribution of manufacturing to employment was higher than the contributions to output, value added and productivity (or equal to the contribution to GDP in the years of 1994 and 2012).

Figure 2. Manufacturing Performance (%), Portugal (1986-2016)



Notes: Labour productivity is the real GVA per hour worked. Shareman denotes the share of manufacturing sector, GDP is gross domestic product,  $l$  is labour,  $lp$  is labour productivity, GVA is gross value added and  $tfp$  is total factor productivity.

Source: Total Economy Database. Groningen Growth and Development Centre.

In the evolution of manufacturing sector from 1986 to 2016, we distinguish two phases. The first, from 1986 to 2004, is characterized by a decline in the share of output, TFP and GVA. After 2004, the 3 aggregates seem to have stabilized below 30%. In 2016, it is observed a small decline.

In 1990 and 2013, the net flows to manufacturing were negative (*i.e.*, foreign divestitures were higher than investments) yet we found that the contribution of manufacturing to the output was higher than the contribution to employment. This evolution cannot be dissociated from further European integration, especially with the *adhesion to the euro* and the privatization process. The appreciation of the national currency (escudo) before the *adhesion* and the setting of an excessively high irrevocable conversion rate between the escudo and the euro had a strong punitive effect, in a context where Portugal could no longer offset the losses in competitiveness via the devaluation of its currency (Mateus 2015). Moreover, privatization heightened the deindustrialisation, as shown, for example, with the liquidation of heavy metallomechanics. These difficulties, combined with a sharp drop in interest rates tended to guide investment to the so-called non-tradable goods, housing, public works and consumption (Marques and Lynce 2011).

We investigated the correlation between FDI flows targeting the manufacturing sector, and the manufacturing performance regarding output, employment, and labour productivity, as well as convergence (using the gap in labour productivity and the TFP vis-à-vis the EU-28 average), respectively. Regarding the manufacturing output, there is a positive but weak correlation in the current period. This correlation is negative but weak for the manufacturing output with one and two period lags. Regarding employment, there is a positive but weak correlation in the current and lagged period, although the value of correlation is higher for employment with two-year lag. This may imply that it takes two years before the foreign projects begin to exert positive benefits regarding employment in the manufacturing sector.

Concerning labour productivity, there is a negative and strong correlation in the current period. This negative correlation is weak regarding labour productivity in lagged periods. As for convergence of productivity with the EU-

28 average, there is a positive but weak correlation with the gap of labour productivity. Because the gap is constructed as the ratio between labour productivity of EU28 countries and labour productivity in Portugal, a positive correlation implies that the larger the flows the larger the gap regarding labour productivity. Hence, despite FDI flows have a positive relation with employment in manufacturing, on the whole economy it appears that foreign firms contribute to deteriorate the labour productivity of domestic firms. One explanation is that may be the case that FDI causes a loss of market share to the domestic firms, via competition and these firms are forced to operate in a sub-optimum scale. As a result, the labour productivity of domestic firms may decrease. However, there is a negative but weak correlation between FDI flows targeting the manufacturing sector and the gap of TFP (current period). In the same line of reasoning, because correlation is negative, it appears that FDI flows to manufacturing industries might help to close the gap regarding TFP.

The EU countries have been experiencing a relative under-performance regarding productivity, when compared to the US. It has been highlighted that the causes were the slower adoption of new technologies compared to the US (Jorgenson and Stiroh 2000, O'Mahony and Vecchi 2005, Venturini 2009), and the insufficient level of skills and organizational changes. Indeed, investments in these two later assets may affect countries' absorptive capacity, *i.e.* their ability to take advantage of the international diffusion of technology (Foster-McGregor *et al.* 2013). Since the bulk of technological innovations is concentrated in few countries, the economies that are far from the technological frontier need to improve the absorptive capacity of their industries as a mean to enhance productivity growth. The evolution of labour productivity in the Portuguese manufacturing sector, measured by GVA per hour worked shows that the Portuguese manufacturing sector follows the trend of the EU-28 average, especially since the financial crisis in 2008. Over the period, the values are near zero. Table 4 shows the Growth Accounting analysis (GVA growth and contributions in volume).

Table 4. Share (%) of MNCs in Total Economy, Portugal (1986-2016)

Year	No.Firms	Employment	Value Added	Year	No.Firms	Employment	Value Added
1986	0.5	7.2	20.3	2002	0.1	2.7	8.1
1987	0.3	4.6	15.2	2003	0.2	4.5	17.6
1988	0.3	5.2	13.6	2004	0.2	4.4	14.5
1989	0.4	5.8	13.7	2005	0.3	5.1	16.4
1990	0.2	5.0	12.5	2006	0.4	5.4	16.5
1991	0.5	8.5	19.9	2007	0.4	5.7	17.0
1992	0.3	5.7	15.6	2008	0.4	6.9	17.5
1993	0.4	5.8	18.7	2009	0.4	6.9	17.6
1994	0.4	8.2	19.8	2010	0.4	7.2	18.4
1995	0.3	5.8	15.7	2011	0.5	7.3	18.7
1996	0.3	4.7	16.1	2012	0.5	7.2	18.6
1997	0.2	4.5	12.6	2013	0.4	7.5	18.8
1998	0.2	4.3	14.4	2014	0.3	5.1	11.8
1999	0.2	3.6	7.8	2015	0.3	4.6	10.6
2000	0.2	3.6	8.5	2016	0.1	2.7	8.1
2001	0.1	2.5	8.5	Average	0.3	5.4	14.9

Source: Author's calculations based in UNCTAD

The contributions for GVA derive from labour (low, medium and high-skilled labour); capital (ICT and non-ICT) and the TFP<sup>7</sup>. The values for 1996-2005 are obtained from EUKlems database (version of 2009 for Portugal) and the values for the remaining years were obtained by multiple imputation in Stata 13.0. The joint analysis of Table 5 and Figure 3 shows that, in the years that recorded peaks of net flows, capital contributions to manufacturing GVA were positive and in 2004, where there is an absolute maximum in regarding net flows, the contribution of TFP was also positive (0.1)<sup>8</sup>. It should be noted that in the cited years of maximum and minimum flows, the contribution of labour to the manufacturing GVA was negative.

<sup>7</sup>This distinction in capital aims to better gauge the impact of information and communication technologies (ICT) on growth.

<sup>8</sup> The contribution is the factor share times the factor growth rate.

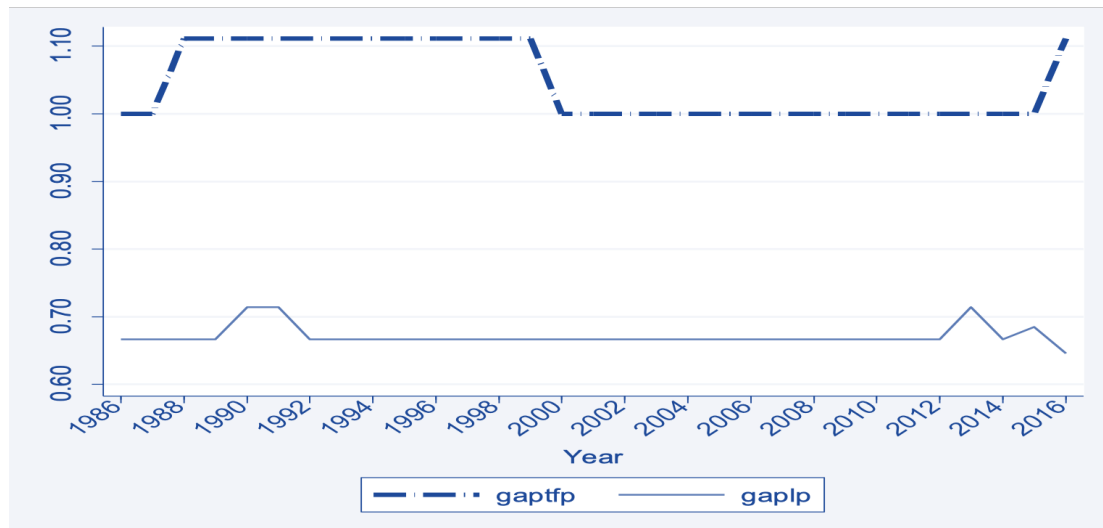
Table 5. Growth accounting in manufacturing sector, Portugal (1986-2016)

Year	Labour	Capital	TFP	Year	Labour	Capital	TFP
1986	-0,5	2,1	0,4	2002	-0,5	1,2	-1,7
1987	0,2	1,0	3,7	2003	-1,0	0,5	-0,5
1988	-1,4	-0,5	7,7	2004	-0,4	0,5	0,1
1989	-0,8	2,1	6,9	2005	0,2	0,5	-2,4
1990	-1,9	2,2	4,4	2006	-0,6	1,0	-1,8
1991	-3,3	1,7	7,9	2007	1,1	1,0	-2,0
1992	-0,8	1,0	-1,9	2008	-0,1	-0,2	-1,6
1993	-0,8	1,7	-2,7	2009	0,1	1,3	-3,9
1994	-0,6	0,6	-5,5	2010	0,2	0,6	-1,7
1995	-1,1	1,3	4,0	2011	2,9	0,3	-5,8
1996	0,8	0,5	6,1	2012	0,4	0,5	-3,4
1997	-2,4	1,3	6,8	2013	-0,9	1,2	-0,5
1998	-1,5	1,4	2,7	2014	1,7	0,8	-4,9
1999	1,5	1,9	-3,8	2015	-2,0	-0,6	7,6
2000	0,2	2,3	-0,2	2016	-0,4	0,3	3,3
2001	-1,5	2,2	0,5	Average	-0,4	1,0	0,6

Note: values for 1986-1995 and 2006-2016 obtained by Multiple Imputation in Stata 13.0

Source: EUKlems database

Figure 3. Productivity gap between the average EU-28 Countries and Portugal (1986-2016)



Notes: Lp is calculated as GDP per hour worked, USD, constant prices, 2010 PPPs and TFP is TFP level at current PPPs (USA=1).

Source: Author's calculations based on OECD.Stat and Penn World Table, version 9.0

Concerning the closing of the technological gap, in 1994, the TFP in Portugal was higher than that of the EU-28 average, but in the remaining years, when there was a maximum in net FDI flows, the TFP level was equal to the EU-28 average. As for the labour productivity gap, it curiously narrowed both in 1990 and 2013 when net FDI flows were negative. This may imply that competition from foreign firms in the host economy caused a loss of domestic firms' market shares. As they are compelled to operate in a sub-optimum scale there is a subsequent fall in their labour productivity.

Tables 6 and 7 concern the contribution of foreign firms in the manufacturing. On average, in the last 30 years of European integration, the subsidiaries represented only 0.3% of the firms but contributed to 15% of value added and 33% of exports, of which (at least) 14% concerns high-tech products (see Table 11). Therefore, in general, FDI in Portugal has contributed significantly to the structural change of exports, towards technology-intensive activities. Thus, the loss of FDI attractiveness seem to have a negative impact on the export performance of the country.

Table 6. Share (%) of MNCs exports in total, Portugal (1986-2016)

Year	MNCs exports in Manufacturing	% Total	Year	MNCs exports in Manufacturing	% Total
1986	1199	22	2002	6875	28
1987	1415	22	2003	6922	24
1988	1875	24	2004	9157	30
1989	2062	20	2005	12849	41
1990	4667	40	2006	8906	25
1991	3703	31	2007	17905	47
1992	5565	45	2008	9746	25
1993	1901	15	2009	13826	44
1994	2898	18	2010	16387	44
1995	3667	21	2011	17514	41
1996	6792	35	2012	20369	45
1997	6440	30	2013	11907	25
1998	4236	19	2014	25436	53
1999	5565	24	2015	17285	35
2000	11006	48	2016	25833	49
2001	10370	45	Average		33

Note: Values in USD Million. Source: Author's calculations based in World Bank (World Development Indicators) and Eurostat.

Table 7. Contribution (%) of foreign firms to high-tech exports, Portugal (1986-2016)

Year	MNCs exports in science based industries (% Manufacturing)	Year	MNCs exports in science based industries (% Manufacturing)
1986	11	2002	5
1987	10	2003	7
1988	8	2004	9
1989	7	2005	12
1990	28	2006	13
1991	16	2007	17
1992	34	2008	8
1993	8	2009	20
1994	8	2010	17
1995	5	2011	16
1996	23	2012	18
1997	14	2013	11
1998	7	2014	17
1999	15	2015	12
2000	19	2016	16
2001	14	Average	14

Source: Author's calculations based in World Bank Database (World Development Indicators), OECD Stat and UNCTAD (2013, 30).

Along the lines of the lower dynamism in promoting FDI, Portugal is the MS where foreign subsidiaries have less weight in employment and wealth creation. Tables 8a and 8b show the foreign firms' performance regarding gross operating surplus and employment.

Table 8a. MNCs' Performance (Gross Operating Surplus) by industry, Portugal (1986-2016)

Industry	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Food products	203	217	190	204	167	205	212	194	156	173	196	199	193	178	198
Beverages	66	49	83	35	35	90	46	47	71	73	76	66	43	69	43
Textiles	14	37	36	11	22	28	22	20	23	14	29	13	12	10	34
Wearing apparel	2	6	6	6	4	5	5	7	4	3	5	5	3	5	3
Leather products	14	19	28	22	33	11	16	14	13	24	44	10	28	16	13
Wood	89	102	115	55	55	114	25	101	75	25	45	22	94	33	95
Paper products	51	66	71	58	67	53	58	49	52	65	59	71	48	49	62
Printing	30	37	15	8	32	56	2	66	6	32	50	32	15	63	31
Chemicals	52	181	83	157	81	147	72	102	173	195	156	186	147	67	153
Pharmaceuticals	122	85	123	114	101	98	110	122	124	105	124	115	106	111	103
Rubber and plastics	240	334	196	305	242	250	283	229	217	207	283	273	251	315	219
Other non-metallic minerals	109	204	194	142	214	109	163	208	158	202	126	204	152	142	211
Basic metals	44	47	50	37	36	55	65	54	38	55	52	66	60	39	49
Fabricated metal products	52	66	68	60	53	59	50	70	70	64	39	56	68	68	66
Computer & electronics	52	53	33	61	49	62	65	76	52	49	73	58	55	68	38
Electrical equipment	90	87	102	58	54	96	98	50	64	70	83	99	120	62	57
Machinery & Equipment	69	102	67	53	65	102	73	104	63	77	58	47	63	105	80
Motor vehicles	362	300	252	317	183	168	273	245	330	245	175	283	322	239	366
Other transport equipment	76	56	58	112	18	14	26	83	22	101	73	25	11	96	150
Furniture	11	41	11	44	29	6	20	29	14	8	38	7	43	40	19
Other manufacturing	47	51	48	49	47	46	45	51	50	51	41	41	40	52	44
Repair and installation	28	24	23	29	28	24	23	25	26	22	22	30	21	26	29

Table 8a. MNCs' Performance (Gross Operating Surplus) by industry, Portugal (1986-2016) (cont.)

Industry	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Food products	162	155	192	194	155	194	204	222	216	202	158	150	141	145	157	169
Beverages	33	95	43	92	94	62	57	97	104	97	91	63	69	88	33	73
Textiles	37	14	24	25	27	9	33	18	6	30	32	25	38	6	24	19
Wearing apparel	3	3	3	4	4	6	7	6	1	6	4	-2	5	7	5	5
Leather products	16	47	17	13	17	18	15	10	8	21	9	13	12	22	41	19
Wood	44	19	37	22	22	17	10	24	13	18	18	19	18	19	10	17
Paper products	72	60	49	60	59	61	56	56	61	76	61	58	64	72	75	65
Printing	37	11	39	12	46	4	4	6	4	2	1	1	0	2	11	18
Chemicals	157	126	159	164	129	110	128	196	140	188	179	51	70	103	159	155
Pharmaceuticals	108	88	86	116	115	85	106	106	124	89	84	94	88	104	107	115
Rubber and plastics	234	324	235	292	279	216	235	165	192	240	272	301	337	340	345	267
Other non-metallic minerals	156	103	182	160	214	150	209	135	103	132	114	92	102	214	106	191
Basic metals	61	61	48	36	41	69	54	35	-24	39	14	10	23	51	64	35
Fabricated metal products	43	55	43	58	49	64	49	69	64	71	38	40	47	62	69	52
Computer & electronics	60	68	38	34	61	59	34	57	54	84	81	62	64	64	40	38
Electrical equipment	68	108	71	121	64	59	106	173	157	165	143	97	106	103	104	108
Machinery & Equipment	92	50	87	65	106	71	42	112	36	63	54	71	56	66	72	98
Motor vehicles	143	221	328	191	303	132	192	284	245	362	394	329	328	366	332	139
Other transport equipment	85	39	114	157	124	2	71	102	149	10	-29	-99	-10	-12	99	155
Furniture	38	8	38	6	12	38	25	-6	2	9	6	4	24	27	38	44
Other manufacturing	48	48	49	40	43	40	42	35	39	41	52	45	46	44	50	51
Repair and installation	21	25	24	29	30	26	22	29	31	24	22	29	24	21	22	24

Source: EUROSTAT, Foreign control of enterprises by economic activity



Table 8b. MNCs' Performance (Number of Employees) by industry, Portugal (1986-2016)

Industry	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Food products	4292	4410	6676	3369	5096	3317	5887	3196	2164	2742	4079	4322	8156	10903	3936
Beverages	6768	4597	1201	4149	1355	3408	3094	2456	3195	2439	3713	4016	2884	2704	1243
Textiles	5878	4776	3804	3488	4986	3569	6331	6886	5862	5412	3193	5574	7175	3382	2405
Wearing apparel	3528	3840	6602	2483	5408	4921	1517	591	2050	5756	2450	1619	475	5914	2390
Leather products	1495	8001	6608	8039	2736	4217	6469	7716	5737	4715	5994	6752	6832	5917	6011
Wood	1221	2434	6359	8064	3916	2440	3611	3398	4972	4686	5100	3544	4005	7692	6435
Paper products	4697	5733	2441	2234	3772	3606	3500	2964	4693	3976	7429	6434	7724	3658	2169
Printing	364	738	507	490	694	627	514	371	160	389	740	430	466	661	773
Chemicals	3133	8315	6367	4063	6143	7262	5620	4283	2705	645	2196	6682	2049	4874	4669
Pharmaceuticals	5664	3771	2828	3822	4432	2595	4139	3082	3120	2166	4372	7437	8300	9196	3310
Rubber and plastics	6219	4375	4729	5884	5205	3212	6744	6693	5841	5392	4624	2316	6595	5389	4056
Other non-metallic minerals	5296	5174	1800	1384	1705	1466	1753	5954	7657	2138	7310	8123	6190	3474	1790
Basic metals	1745	1546	7842	2125	3196	6565	4939	2023	3982	2708	4420	7103	1618	1950	5782
Fabricated metal products	9645	7270	6039	7843	4897	7610	7491	9938	8028	6413	5589	4007	4089	5031	6595
Computer & electronics	8021	8074	4779	8203	1757	5212	1543	3326	2760	3252	2262	7465	8184	6625	5704
Electrical equipment	4740	9474	8140	4484	2301	2452	3341	2733	3094	5220	8990	10210	6097	8444	5601
Machinery & Equipment	3563	3044	4794	4722	2392	7324	2050	1745	4473	4281	4872	4971	6185	7510	5684
Motor vehicles	1062	1448	13096	12780	13481	13114	9130	13874	17469	13931	16650	17240	16620	11786	17755
Other transport equipment	5517	7300	5173	7527	7092	7365	7327	4552	4697	3139	3916	5505	8658	5895	5655
Furniture	2027	4558	6612	3517	2933	1033	2276	2092	1556	2996	6941	8045	4314	5067	4287
Other manufacturing	5458	4252	3525	3535	2930	4386	3643	5170	4610	5713	6087	3282	1645	10206	2682
Repair and installation	4554	3174	6889	7009	5143	3159	4119	3770	5106	4531	5557	5601	3769	2082	2881

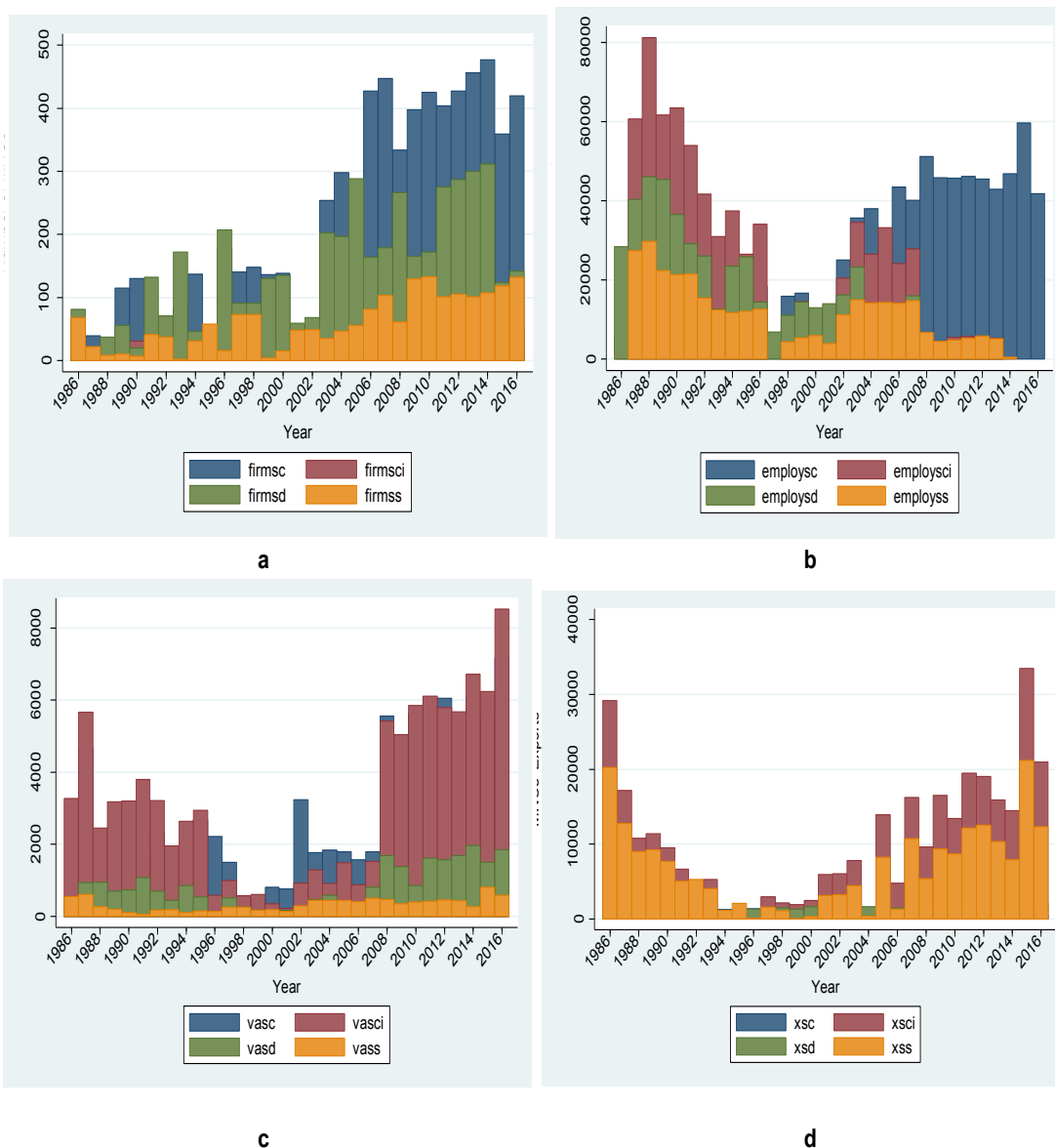
Table 8b. MNCs' Performance (Number of Employees) by industry, Portugal (1986-2016) (cont.)

Industry	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Food products	3932	4242	3076	7437	8680	6131	8795	9427	7124	8873	8999	8593	8394	9592	8718	5967
Beverages	2753	3878	2772	1270	2364	3453	3154	2684	2590	2395	2380	2302	1991	2265	3595	1260
Textiles	3810	4286	3921	1209	2098	7715	6519	4014	3592	3363	3197	2694	2772	2964	4030	3659
Wearing apparel	3684	4310	5868	3664	4927	5906	3880	4692	3737	3638	3534	3396	3410	3375	4906	4100
Leather products	4262	4806	3002	4468	6831	4327	6809	4963	4601	6759	3681	4102	4746	5262	5678	2270
Wood	5550	2332	3947	4351	4842	3618	2233	1369	1250	1241	1267	1219	1146	1405	1253	1731
/Paper products	2797	2628	2743	2519	1040	3756	1320	2275	2206	2168	2064	2036	2180	2360	2763	1069
Printing	563	981	963	503	732	492	415	477	454	392	386	379	271	292	146	264
Chemicals	3801	7241	5754	4351	5711	6774	5237	5488	5094	5169	5092	4897	4556	4597	5049	4536
Pharmaceuticals	7050	4458	2876	2506	4651	3287	2158	2157	2432	2401	2416	2518	2339	2442	2940	2527
Rubber and plastics	6099	7548	5604	6543	6493	8424	8415	6055	5556	5751	6163	6179	6073	6437	3004	5221
Other non-metallic minerals	3734	3683	4192	5276	7446	6884	5863	6277	5811	5611	5448	5228	5329	6413	5588	7095
Basic metals	6599	7446	3448	3193	4307	4046	2498	2562	2271	2251	2307	2067	2154	2622	2313	1162
Fabricated metal products	7599	6617	8141	3441	6037	4575	3675	4698	4410	4420	4353	4248	4743	4988	2184	4410
Computer & electronics	4462	6953	6644	6000	5161	3039	3953	4763	5828	5978	5650	5502	5080	5288	6533	5075
Electrical equipment	4292	5594	3901	4293	9330	7949	6448	9149	8947	9145	9496	9444	9573	9430	8833	7025
Machinery & Equipment	7411	3073	4028	3477	6638	5002	6735	5902	3693	4080	4273	4909	4233	4458	7265	6589
Motor vehicles	11095	11380	12310	15769	11398	15029	22352	22874	19999	18831	19108	19163	19315	19591	18828	14371
Other transport equipment	4389	5589	9110	3312	7513	6053	5011	3620	6207	1492	3584	2643	1586	1610	1859	4483
Furniture	3121	2123	1035	2909	1360	2355	2407	1872	1502	2098	2110	2301	2247	2318	2229	2910
Other manufacturing	3986	2324	1814	3185	7246	6136	2860	2368	2531	2513	2717	2770	2737	2611	1769	1865
Repair and installation	6408	4712	7339	5897	3340	2036	2481	2676	2758	2743	2867	2746	2651	2747	3362	2910

Source: EUROSTAT, Foreign control of enterprises by economic activity.

Regarding the gross operating surplus, the importance of subsidiaries in 1986 - 2016 was greater in the motor vehicles industry, food products, rubber and plastics and chemicals, *i.e.*, in scale intensive and science-based industries. The role of subsidiaries in creating employment was more relevant in the motor vehicles industry, food products and electrical equipment, rubber and plastics and other non-metallic minerals, again in scale intensive and science-based industries.

Figure 4. MNCs by technological groups, Portugal (1986-2016)



Notes: Panel a- Number of firms (*firm*), panel b-Number of employees (*employ*), panel c- Value Added (*va*) and panel d- Exports (*x*). Sc denotes scale intensive industries; sci denotes science-based industries; sd denotes supplier dominated industries and ss denotes specialized suppliers' industries. Nominal values are in EUR Million.  
 Source: Author's calculations based in EUROSTAT- Foreign control of enterprises by economic activity (Portugal).

Scale intensive industries are major contributors to the number of firms and employment, with science-based industries being the group with fewer firms and the specialized suppliers contributing less to employment (see Figure 4). The presence of foreign firms can trigger knowledge externalities to the manufacturing domestic firms, which are main vehicles of technological change due to their upstream and downstream linkages. Identifying the drivers of productive efficiency is crucial to understand the sources of the productivity gap. Thus, we will examine whether there was technological change in the Portuguese economy to assess the efficacy of public policies and instruments (financial incentives provided by the Structural Funds) in Portugal.

### 2.3. Technological Change

We analyse a dataset of indicators of technological change, in order to establish the correlation between its changes and the evolution of FDI inward flows. If the correlation is positive, it may indicate a positive impact of FDI on innovation and/or the absorptive capacity in the Portuguese economy. The construction of the dataset employs the method of multiple imputation.<sup>1</sup> Specifically, we construct a dataset that contains no missing values. The dataset comprises 8 indicators measuring two important country-specific dimensions: innovation and technological capabilities, and absorptive capacity (see Table A1 in Appendix A).

The dataset that is obtained by estimating the missing values in the original data sources (Pordata and Ministry of Science) provides comprehensive statistical information for the period 1986-2016 (for a total of 31 observations). Our empirical analysis of this dataset shows its reliability and points out its usefulness for future time series studies of the Portuguese national innovation system. Historically, the first generation of innovation indicators focus on inputs such as R&D investment, education expenditure, capital expenditure, research personnel, university graduates, technological intensity, and the like.

The second generation added input indicators by accounting for the intermediate outputs such as patents, scientific publications and new products and processes. The third generation draw attention to indicators and indexes based on surveys. Although some of the information collected is now qualitative, there is no question that a fourth generation of innovation indicators is required for sound policy implementation. Such indicators would account for Knowledge, Networks and Conditions for innovation. A multi-layered concept like knowledge, however, can only be captured by composite indicators that may include composite knowledge investment and performance indicators; networks should include contractual agreements (partnerships, intellectual property licensing) and informal collaboration and knowledge exchange (working relationships of individuals across organizations); finally, Conditions for innovation refers to systemic innovation measures that capture the context in which organizations form and match expectations and capabilities to innovate. Yet, so far, these 4th generation indicators remain ad hoc and are of limited analytical value. They can be improved only through a coordinated and internationally effort.

Table 9 shows the most used innovation and absorptive capacity indicators. A major criticism of most absorptive capacity measures is that they were developed for large firms and are therefore totally inadequate for small firms. Since small firms do not always have a specific R&D department, it can be difficult to measure the resources allocated to research activities. Furthermore, as many small firms consider the patent process to be too expensive and time-consuming, the indicator of Patent registrations is also frequently inapplicable. Thus, the absence of a R&D department or a patent registration policy does not mean that a firm does not acquire knowledge. Hence, the suitability and validity of proxy measures for absorptive capacity are highly empirically questionable.

After Castellacci and Natera (2013) we measure the dimension of the process of technological change, *i.e.* the dynamics of the Portuguese innovation system, through a set of indicators of innovative capability and absorptive capacity. Regarding innovative capability, the more domestic firms acquire and absorb new knowledge, the more innovation and competitive advantages they will obtain (Kim 1998). Since absorptive capacity is a by-product of R&D (Cohen and Levinthal 1990), innovative input is used as a measure of innovative capability, proxied by R&D expenditures as a percentage of GDP. The assimilation of new knowledge that may lead to the development of new products and processes; and/or the ability to reform the organizational routines, to apply knowledge can be measured by technological and scientific output, respectively proxied by the number of patent applications by residents and the number of scientific publications. As far as absorptive capacity is concerned, GDP per capita controls for the purchasing power of the domestic market. The income and the development level are likely to hustle output growth (Balasubramanyam *et al.* 1999) and are measured by GDP per capita, purchasing power parity. Indeed, assuming that the higher the GDP per capita, the greater the level of development, and the more education infrastructures. *Cøteris paribus*, the existence of universities and other educational institutions increases the absorptive capacity.

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<sup>1</sup> Multiple imputation is an iterative method to address missing data and fittingly reproduce the variance/covariance matrix one would have observed. In this process, the distribution of the observed data is used to estimate multiple values that reflect the uncertainty around the true value. These values are then used in an OLS model, and the results combined.

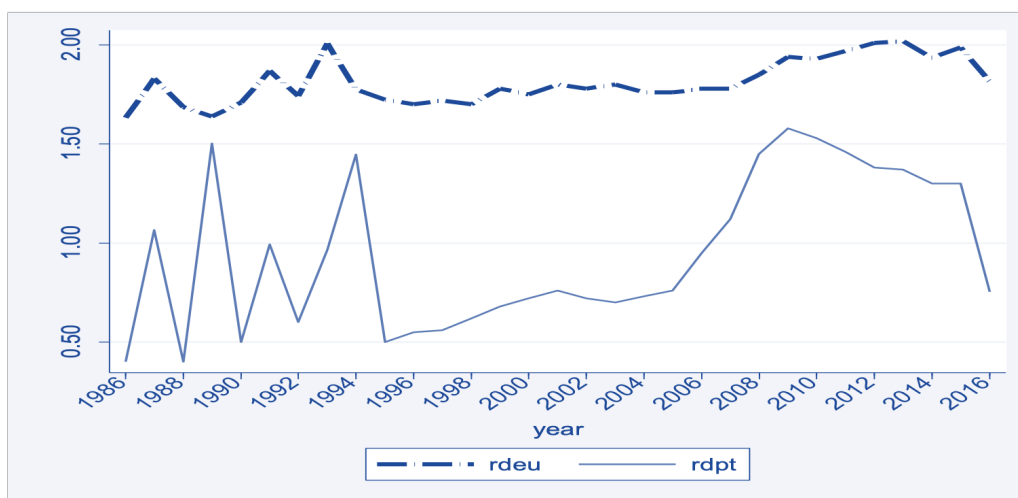
Table 9. Most common innovation and absorptive capacity indicators

Measure	Studies	Main advantages	Main drawbacks
<b>Innovation indicators</b>			
- Process innovations	<i>West et al.</i>	-Reflects	-Focus solely on processes
-Ratio of sales of new products to total sales	Czarnitzki & Kraft (2004)	-Indicator of market success	-Since it is a very broad indicator, it may reflect the impact of other factors besides innovation
-Total R&D spending; Number of employees in R&D	García-Morales <i>et al.</i> (2008)	-Easy to obtain	-Does not provide indication of innovation efficiency
-Patents or patent applications	Jung <i>et al.</i> (2008)	-Measures technological progress	-Nearly 95% of patents lack any market relevance and 99% fail to bring any profit to the firm (Stevens & Burley, 1997)
-New products or product improvements; New markets entered	Elenkov & Manev (2009)	-Indicator of radical innovation; reflects concrete implementation	-Only about 60% of new products succeed
-Ratio of sales of new products to R&D expenditures	Gumusluoglu & Ilsev (2009)	-Indicator of R&D efficiency	-Difficulty to establish a valid baseline
-Patent citations	Makri & Scandura (2010)	-Measures importance of patents	-Patents may be self-cited
-R&D expenditures (% GDP); number of patent applications by residents; number of scientific publications.	Castelacci and Natera (2013)	-Easy to obtain, measures technological progress	-Does not indicate innovation efficiency; patents usually lack market relevance; publications may be self-cited
<b>Absorptive Capacity indicators</b>			
-Total Number of Publications based on dollars spent on research annual	Cockburn, Henderson (1998)	-Generally accepted measure that can be used for international comparisons. -Data on patents are easily and internationally	-Purely quantitative measure. Data are not readily available. International and sectoral differences in patenting behaviours. -There are differences in patenting between large and small firms. -Same weight is given to very important and less important patents.
-Number of Patents	Ahuja, Katila (2001), George <i>et al.</i> (2001)		
-Participation in life-long learning; -Employment in medium/high-tech industries	Kutlača (2008)	-Employment in medium/high-tech industries is easy to obtain	- Participation in life-long learning is difficult to obtain, due to incipient tracking down system. -Systematized indicator for European Countries is recent. -Employment in medium/high-tech industries have a limited explanatory power considering that there are several other sources of absorptive capacity
-GDP per capita, purchasing power parity; International Trade (Imports+ Exports % of GDP); -Number of Total Graduates; Electric Power Consumption; Gini Index	Castelacci and Natera (2011)	-Generally accepted measure that can be used for international comparisons. -Data are easily and internationally.	-GDP per capita is an average measure.

Source: adaptation based on Duchek (2013), Flatten *et al.* (2011), Jimenez-Barrionuevo *et al.* (2011), Murovec and Prodan (2009)

Moreover, many empirical studies analyse the relationship between absorptive capacity and international technology transfer. These studies use international trade, as a measure of foreign technology that can be proxied by Imports+ Exports as a percentage of GDP. Higher education increases the ability to utilize new knowledge. Thus, higher absorptive capacity will lead to high performance (Conlin 2006). Accordingly, we use an indicator of human capital measured as the total number of graduates. Furthermore, the World Bank (World Development Indicators Database) uses infrastructures as an indicator of penetration of older technologies. First rate infrastructures devoid of a sufficiently qualified labour force will be useless and vice versa (Abramovitz 1989). Infrastructures can be measured by the electric power consumption<sup>2</sup>. Because the access to education requires income, income inequality reveals primarily as a social problem of unequal access to education, arising from inadequate access to resources (Ball 2004, Teese and Polesel 2003). The income distribution can be associated with social cohesion and economic inequality (Alonso and Garcimartin 2011) and can be measured by the Gini Index. Starting with innovation, we analyse the R&D expenditure as a percentage of GDP in 1996-2016 (Figure 5).

Figure 5. R&D Expenditure (% GDP), average EU-28 and Portugal (1986-2016)

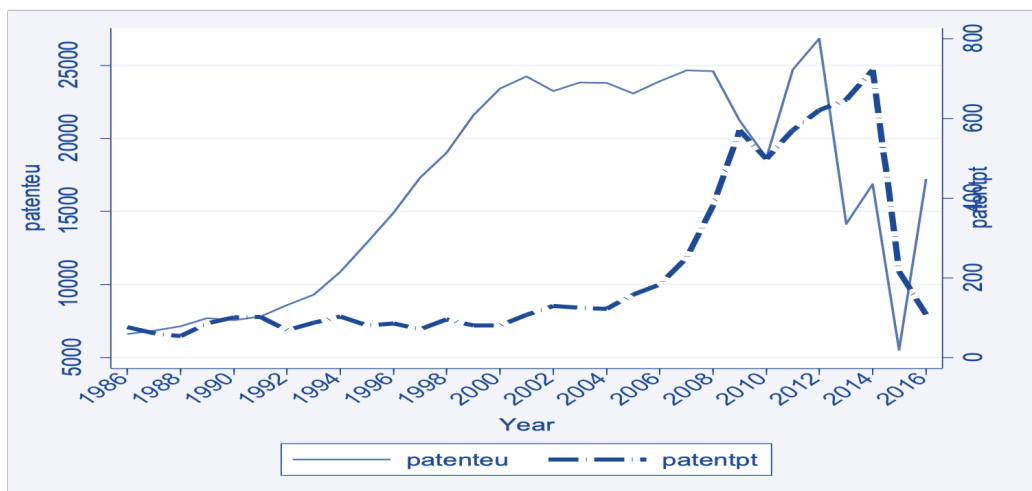


Notes: rd denotes Research & Development expenditure; eu denotes European Union and pt denotes Portugal.  
Source: Worldbank database (World Development Indicators).

After joining the EEC, the weight of R&D in GDP, in Portugal, increased from 0.4% in 1986 to 0.8% in 2005. In 2009, this indicator rose to 1.6%, but became stable around 1.4% in 2012. This evolution allowed Portugal to converge with the EU. In fact, if in 1995 this indicator represented about a third of that for the EU average; in 2009, it reached the maximum of 82% of the EU average. However, after 2009, the economic conjuncture threatened the objective in line with the strategy Europe 2020 of increasing R&D spending to 2.7% of GDP. Currently, Portugal is one of the most lagging MS regarding innovation capability, especially concerning patent applications (Mateus 2015). From 1986 to 2012, on average the number of registered triadic patents in Portugal represented only 1.3% of the EU-28 average.

<sup>2</sup> Archibugi and Coco (2004) suggest another two indicators: internet and telephone penetration. According to the authors, Internet is a key infrastructure for business and as a mean of access to knowledge; while telephone mainlines connect customers' equipment to the public switched telephone network allowing communications and exchange of knowledge. However, we could not get values for internet prior to 2001. About telephone subscribers, we obtained data from World Bank development indicators, but it was not clear how many countries were included in the data, since the period 1986-2016 includes several EU enlargements. Hence, we could not calculate the average value.

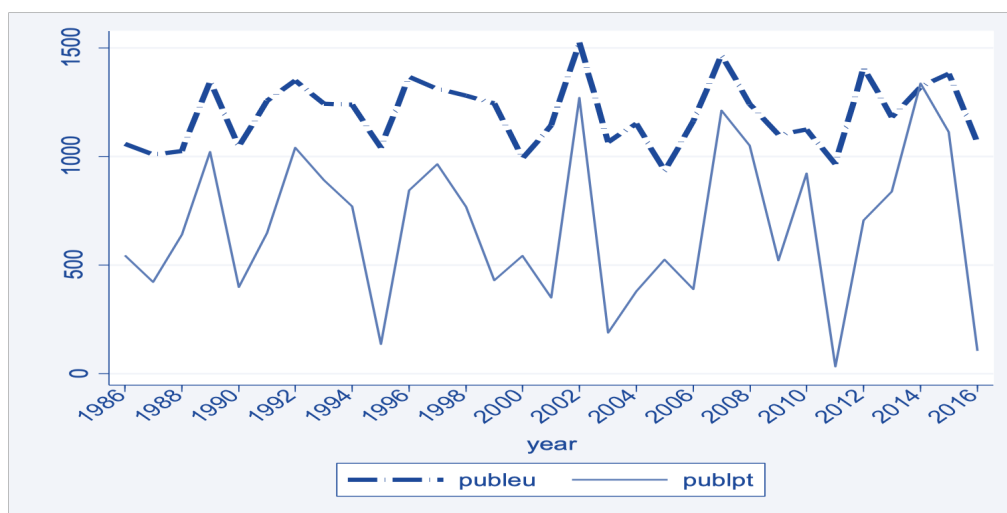
Figure 6. Number of patents, average EU-28 and Portugal (1986-2016)



Notes: patenteu denotes patents in the European Union and patentpt denotes patents in Portugal.  
Source: PORDATA

Figure 7 shows the number of scientific publications in Web of Knowledge, concerning the EU-28 and Portugal over the period 1986-2016<sup>3</sup>. The number of Portuguese scientific publications represented on average nearly 55% of that of EU-28 per year. The number of publications in Portugal was much more volatile in the period, with an average of 678 publications per year, than that of EU-28, with an average of 1195 publications/year.

Figure 7. Number of Publications (ISI -Web of Knowledge), average EU-28 and Portugal (1986-2016)



Source: OCEC, Ministry of Science and Higher Education

According to the European Commission (2013), R&D intensity in 2000 to 2011 was on average of -0.16% in Portugal, compared to 0.8% of the EU average. On the contrary, in terms of Excellence in S&T, in 2005-2010, Portugal had a better performance than the EU average (4.23% and 3.09%, respectively). Regarding Innovation and structural change, in 2010-2011, Portugal represented only 62% of the EU average, concerning the Index of economic impact of innovation (0.38% and 0.61%, respectively). Yet, in 2000-2010, the Portuguese performance regarding knowledge-intensity was well above that of the EU average (3.18% and 0.93%, respectively). Regarding the absorptive capacity indicators, we start with the Income and Development Level. The GDP per capita in Portugal represented 76% of the EU average both in 1986 and 2016. On average, the GDP per capita expressed in PPPs in Portugal was 79% of the EU28 average over the period 1986- 2016 (see Figure 8).

<sup>3</sup> It is an integrated Web platform that provides information for research.



Figure 8. GDP per capita in pps, average EU-28 and Portugal (1986-2016)



Note: eu denotes European Union and pt denotes Portugal.

Source: PORDATA

However, regarding this indicator, the distance between the EU-28 average and Portugal has increased when compared with the situation in late 1980s and early 1990's, soon after the EEC accession. Turning to international trade, Figure 9 shows fluctuations in 1986-2016, with peaks in every 7-10 years' periods, i.e. in 1990, 2000, 2008 and 2015.

Figure 9. Trade (% of GDP), average EU-28 and Portugal (1986-2016)



Note: eu denotes European Union and pt denotes Portugal.

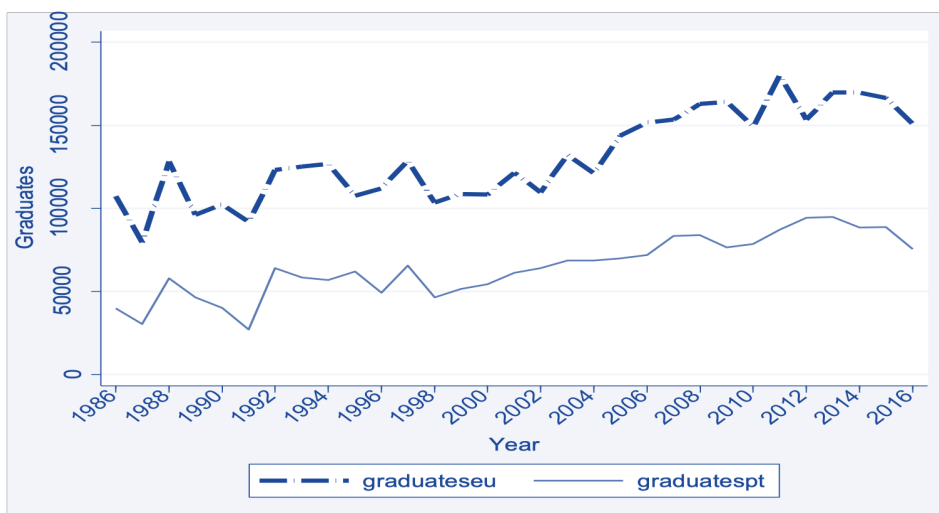
Source: Worldbank database (World Development Indicators).

We can split the period under analysis in two subperiods: the first starting in 1986 until 2000, when the Portuguese economy showed a greater dynamic concerning international trade, as a share of GDP, than that of the EU-28 average; and after the year 2000, when the situation was reversed, and Portugal became less dynamic regarding trade openness.

The analysis of Figure 10 shows that the number of total graduates (male and female) from 1986 to 2004 has been increasing in Portugal. However, the distance from the EU-28 average remained stable. After 2004 the distance widened and, after 2013, we can observe a tendency of decrease regarding the number of graduates both in Portugal and the EU.



Figure 10. Total number of graduates, average EU-28 and Portugal (1986-2016)

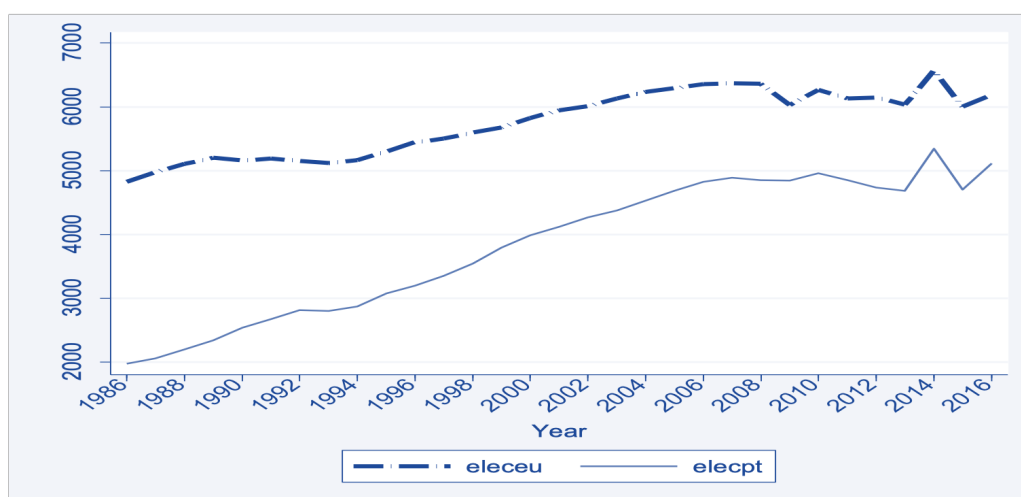


Note: *eu* denotes European Union and *pt* denotes Portugal.

Source: PORDATA

The electricity consumption in Figure 11 shows an increase over the period, similar to the evolution in the remaining EU countries. However, the rate of growth has been higher in Portugal and, as a result, the distance has narrowed about one half, compared with the consumption in 1986.

Figure 11. Electric Power Consumption (kWh per capita), average EU-28 and Portugal (1986-2016)

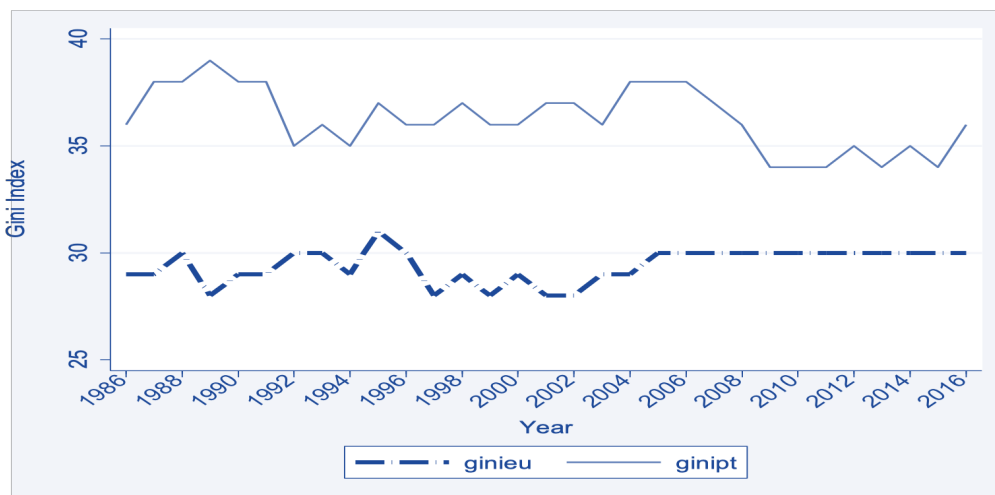


Note: *eu* denotes European Union and *pt* denotes Portugal.

Source: Worldbank database (World Development Indicators).

Finally, the Gini coefficient (Figure 12) measures income inequality ranging from zero for countries with no income inequality and one for countries with the greatest possible income inequality.

Figure 12. Gini Index (%), average EU-28 and Portugal (1986-2016)



Note: eu denotes European Union and pt denotes Portugal.

Source: Pordata

According to the OECD database, in 2011-2012, Portugal improved its position from 0.343 to 0.338. During this period, Portugal was the ninth most unequal country among the 34 OECD countries, with a rate above the average rate of 0.315. 10% of the richest Portuguese population concentrated 25.9% of the income, while 10% of the poorest population concentrated only 2.6% of the income. The bulk of the income (63%) was concentrated on 40% of the population. These high levels of inequality may have a negative effect on the productivity gap. In the period described, income inequality decreased only 4%. According to ISCTE data from the inequalities observatory, Lithuania recorded the greater income inequality in 2009, with a Gini coefficient of 37%, closely followed by Latvia with 36%.

Portugal, along with Spain, recorded the third highest indicator of 34%. In a nutshell, from the analysis of the indicators in the previous section, although Portugal has managed to improve its innovation gap, it seems it has failed to convert this into real economic convergence. In this context, the R&D intensity and the level of qualifications are regarded as major difficulties that prevent the increase of competitiveness of the Portuguese economy, affecting the potential growth of output. On the other hand, the improvement in innovation has occurred mostly in the public sector, while scoring on business innovation performance remains low (Veuglers and Mrak 2009).

Still, in recent years, the restrictions in the public finances motivated by the external debt, had interrupted the growth path of R & D investment financed by public funds, while the adverse economic context due to the financial crisis had a negative impact on firm innovation, including business cooperation with the R&D institutions. Moreover, innovation alone is not enough to increase productivity. Laggard economies must possess the ability to absorb, internalize and utilize the knowledge potentially made available to them. In other words, the absorptive capacity allows them to be able to generate new technologies and use resources efficiently, to increase productivity (Narula 2004).

The indicators of absorptive capacity reflect in general an improvement in absolute terms. However, the distance between Portugal and the EU-28 average has widened, except in those indicators concerning infrastructures and inequality. In order to get some insights on the role of FDI flows to innovation and absorption capacity in Portugal and to the convergence of gross value added between Portugal and the EU countries, we conducted a correlation test to verify the relationship degree between FDI inward flows and the Innovation system indicators as well as with the gap between the Portuguese gross value added towards EU countries.<sup>4</sup> The correlation coefficients are shown in Table 10.

<sup>4</sup> Data on Gross value added (current basic prices in millions of Euros) for Portugal and the aggregate European Union Countries comes from EUKlems database- November 2009 release, March 2011 update.

Table 10. Correlations between FDI flows and Innovation system indicators and gap, 1986-2016

	FDI	R&D	Pub.	Patents	GDPpc	Trade	Graduates	Electric	Gini	Gap
FDI	1.00									
R&D	0.66*	1.00								
Pub.	0.18	0.28	1.00							
Patents	0.84*	0.71*	0.19	1.00						
GDPpc	0.89*	0.48*	0.04	0.65*	1.00					
Trade	0.76*	0.49*	0.18	0.67*	0.77*	1.00				
Graduates	0.88*	0.50*	0.20	0.74*	0.83*	0.71*	1.00			
Electric	0.89*	0.44*	0.05	0.65*	0.96*	0.69*	0.83*	1.00		
Gini	-0.56*	-0.46*	-0.16	-0.63*	-0.47*	-0.34	-0.60*	-0.44*	1.00	
Gap	0.37*	-0.02	-0.08	0.06	0.53*	0.18	0.37*	0.66*	-0.12	1.00

Note \* significant at 5% level. Pub denotes publications. Source: own calculations in Stata 13.0

The correlations between FDI inflows to Portugal and the innovation indicators are strong (coefficient > 0.5), positive and significant (at 5% level), except for scientific publications. Regarding the absorptive capacity, all indicators are positively and strongly correlated with FDI inflows, except for Gini index, which shows a negative, strong a significant correlation (-0.5664). Since the higher the Gini index, the larger the inequality, it may be the case that FDI inflows have been contributing to reduce economic and social inequality in Portugal. Finally, the gap between Portugal and the EU countries is positively and significantly correlated with FDI inflows, GDP per capita, the number of graduates and the electric power consumption. Since the higher the value of the GAP indicator, the greater the convergence with the EU countries, the sign of correlations may indicate that FDI flows have been contributing to reduce the gap. Moreover, the increasing number of graduates, increases the absorptive capacity of the Portuguese populations and this may have an impact on convergence of GVA towards the EU countries. Since the value of the coefficient is strong for the GDP per capita and the electric power consumption it may imply that those indicators may have a strong impact on reducing the gap. The statistical significance of correlation coefficients specify that all chosen indicators are valid for the analysis of the contribution of FDI inflows to innovation and absorptive capacity, except for scientific publications. Tables 11 and 12 show the goals of Technological plan and Portugal 2020, aiming to converge with the EU-28 average.

Table 11. Goals of Technological Plan, aiming to reduce the technological gap, 2005

	Goal
Human resources allocated to R&D and scientific publications in international journals	+50%
Number of PHDs in Portugal and abroad	1500
Private expenditure on R & D	+300%
Public expenditure on R & D	1% of GDP (+200%)
Public R & D activities	+1000 jobs
Number of registered patents	+300%

Source: <https://infoeuropa.eu/ocid.pt/files/database/000035001000036000/000035449.pdf>, 26 pp

Table 12. Goals of Portugal 2020, aiming to converge with the EU-28 average, 2014-2020

Indicator	Objective	Measure	Goal (PT2020)
Innovative capability	Reinforcement of R&D and Innovation	R&D (% GDP)	2.7%- 3.3%
Absorptive capacity	More and better education	% Population with higher education or equivalent (30-34 years old)	40.0%
	Fight poverty and social inequalities	People at risk of poverty (compared to 2008)	-200,000

Source: Adapted from [http://ec.europa.eu/europe2020/pdf/nd/prgprep2013\\_portugal\\_pt.pdf](http://ec.europa.eu/europe2020/pdf/nd/prgprep2013_portugal_pt.pdf), 9 p.

It has been argued that the difficulties in the convergence process are not related to factor intensity or technological progress but with the contribution of efficiency to TFP. Indeed, from 1986 to 1998, structural change was characterized by a transfer of labour from agriculture to services; while the weight of the manufacturing employment has remained broadly stable and output has declined. TFP can be expressed in terms of technology growth and efficiency. The former includes the effect of positive externalities which is a driver of economic growth. Amador and Coimbra (2007) show that, in 1995-2005, the contribution of efficiency was negative due to investment in real assets with low return, such as housing. Since many services are non-tradable, this resulted in lower productivity gains and lower the average contribution of TFP to economic growth to merely 0.2% in 1990-2000.

Hence, the inclusion of both tradable and non-tradable sectors can hinder the analysis of structural change, as measured by the TFP performance.

According to predictions of the EC (2016): "As economic conditions are expected to improve and investment to pick up, capital accumulation would eventually raise the growth potential. Prospects for labour force development are less optimistic". In contrast, the TFP of the Portuguese economy is expected to improve slightly in the medium term. Nevertheless, the low average skill level of the labour force, although improving, and the low level of innovation may deter the growth of the TFP.

Being a small open economy located on the outskirts of Europe, Portugal is vulnerable to external factors that hamper economic growth. The competitiveness problems of the Portuguese economy were also reflected in the decrease of FDI flows. Yet, sectoral empirical studies exist that, by estimating externalities from FDI via backward and forward linkages for the Portuguese manufacturing industry, allow to design FDI policies aimed at this specific industry. In this context, FDI policies may put forward suitable incentives to reach the FDI sectoral composition that enhances greater TFP growth for domestic firms, through externalities from FDI via backward and forward linkages.

### 3. Policy Recommendations to Boost Productivity and Growth

Based on previous sections, we make some recommendations on the design and implementation of FDI policies in articulation with industrial policy, *i.e.*, according to the type of FDI externality, technological groups and/or specific manufacturing industries. One should notice that, a more comprehensive ex-ante evaluation of FDI policy would also apply to other sectors. In such scenario, we would most probably be led to a choice of a mix of FDI in manufacturing and services. However, this is beyond the scope of our research. These recommendations consider a logical framework for intervention to ensure causal linkages between, on the one hand, the specific goals and constraints associated with strengthening the articulation between FDI and Industrial policies, and, on the other hand, between the proposed policy measures/instruments and the expected results. Accordingly, in Table 13, the first policy component goals, determines the rest: constraints, policy measures/instruments, expected results and recommendations. The Policy goals are the increase of manufacturing competitiveness, the reduction of the technological gap, the convergence of productivity, the attraction of FDI and the promotion of economic growth and employment.

Regarding the manufacturing competitiveness, the main barriers to this goal are deindustrialization, international competition, and the highly fragmented value chains. Hence, measures targeting all industries should be taken, such as the promotion of entrepreneurship; access to credit and the strengthen of the intellectual property rights and the competition policy. FDI Policies need to tailor to the specific requirements of investors. If this is accomplished, it is expected that foreign firms, especially in scale-intensive industries in Portugal contribute to increase the turnover, employment, value added and gross operating surplus.

Thus, policy recommendations include the promotion of structural change towards economic activities with high added value via technological change. However, the major obstacles regarding the reduction of technological gap are the lack of fluidity in the technology transfer from universities to firms, low level of innovation capabilities and the reduction of public incentives for innovation, since R&D activities are expensive and small firms may be discouraged to pursue innovation in the absence of some public funding. To accomplish this goal, measures should be taken to stimulate innovation and cooperation between firms and scientific organizations.

Concerning the barriers to the convergence of productivity, the main are the erosion of competitiveness, the allocation of resources to non-tradables, the specialization in sectors of low technological intensity and the low average of labour skills. Hence the focus on the manufacturing as a driver of economic recovery aims to reduce the disparity in labour productivity towards the EU-28 average. In order to close the gap, the convergence process must be assisted by a reinforcement of supply-side measures and simultaneously it must favour certain industries where there is evidence of positive externalities from FDI. Finally, barriers to attracting FDI and promote economic growth and employment are the fact that the Investment promoting policy is moving to European level and thus leaving the government with no autonomy to pursue such a FDI promoting policy prone to maximize externalities from FDI; the public budget constraints, the FDI strategies with narrow scope, and the difficulty of IPAs to identify business opportunities.

Measures include Structural Funds, the special visa regime, definition of priority industries and the improvement of the institutional environment. If authorities are successful in attracting the right kind of FDI projects, it is expected at the aggregate level, that an increase of one percent in turnover of foreign firms in downstream and upstream industries may contribute to an increase of domestic firms' TFP of 0.0629 and 0.306 percentage points. This analysis seeks to contribute to the drawing up of a well-defined strategy. Thus, it is possible to state that the

general objectives set out are in line with the major constraints posed by policies analysed here and thus constitute an appropriate starting point for further strategic specification. In this respect, the low levels of qualification of the population, the maladjustment of the articulation with the labour market; and the persistence of areas of inefficiency and the lack of innovation conform the main constraints. Finally, the system of goals and measures/instruments is articulated with the indicators of innovation and absorptive capacity. There are explicit synergies between specific objectives and measures/instruments. In this context, the selected indicators are generally relevant, and their formulation clearly expresses the associated measurability dimension. The indicators use appropriate calculation methods and present realistic values against the objectives and resources.

Regarding Investment priorities, the Portuguese Investment Promotion Agency (AICEP) aims to attract foreign Investment focusing into three groups of priority industries: heavy industries that rely on domestic sources of raw materials (iron, copper, lead and zinc); traditional industries such as textiles to increase the competitiveness; and industries in which Portugal already has a comparative advantage (e.g. electrical equipment, electronic equipment and telecommunications).

Table 13. Components of the Ex-Ante Evaluation of FDI and Industrial policies

POLICY				
Goals	Constraints	Measures/Instruments	Expected Results	Recommendations
Strengthen the manufacturing sector, consolidate poles of competitiveness, according to a specialization strategy	<ul style="list-style-type: none"> <li>- Privatization has increased deindustrialization;</li> <li>- Manufacturing is organized in highly fragmented value chains;</li> <li>- Competition from emerging economies.</li> </ul>	<ul style="list-style-type: none"> <li>- Horizontal measures (targeting all sectors);</li> <li>- Creation of an environment conducive to entrepreneurship;</li> <li>- Promotion of businesses angels and venture capital;</li> <li>- Flexibility of the labour market;</li> <li>- Access to credit;</li> <li>- Strengthen the internal market (intellectual property rights, competition policy, infrastructures, and standards)</li> </ul>	<ul style="list-style-type: none"> <li>- MNCs in scale-intensive industries may be the major contributors regarding turnover, employment, value added and gross operating surplus;</li> <li>- Foreign firms may have a major role regarding Gross Operating Surplus in the automotive industry, rubber and plastics and non-metallic mineralsä;</li> <li>- Subsidiaries may create a larger number of jobs in the automotive, food and electrical equipment industries.</li> </ul>	<ul style="list-style-type: none"> <li>- Policies need to tailor to the specific requirements of investors, and be difficult to replicate elsewhere;</li> <li>- Industrial policy should contribute to: achieving higher levels of competitiveness through increased industrial productivity. Accordingly, it should: <ul style="list-style-type: none"> <li>- Address systemic failures and attract FDI projects that lead to positive externalities;</li> <li>- Conceal horizontal policies that support the manufacturing sector, with vertical policies targeting specific sectors</li> </ul> </li> </ul>
Reduce the technological gap	<ul style="list-style-type: none"> <li>- Lack of fluidity in the technology transfer processes from universities and other R&amp;D institutions to domestic firms;</li> <li>- Low level of innovation capabilities of domestic firms;</li> <li>- Government incentives for innovation have been reduced;</li> <li>- Difficulty in adopting modern production techniques, organizational practices and in creating new products;</li> </ul>	<p>Technological Plan:</p> <ul style="list-style-type: none"> <li>- Stimulate innovation;</li> <li>- Enhance cooperation between firms and scientific and technological organizations;</li> <li>- Inclusion of PhDs in domestic firms through financial incentives for SMEs;</li> <li>- "Horizontal" emphasis on research strategies and the promotion of industry-wide innovation to increase productivity and economic growth.</li> </ul>	<ul style="list-style-type: none"> <li>- According to the technology-accumulation hypothesis, if the gap is too large, domestic firms do not possess the necessary "absorptive capacity" to incorporate the knowledge of foreign firms.</li> </ul>	<ul style="list-style-type: none"> <li>- Innovation facilitates structural change towards economic activities with high added value</li> <li>- Structural change via technological change.</li> <li>- The change of Portugal's specialization towards techno-low and capital-intensive products should continue.</li> </ul>

POLICY				
Goals	Constraints	Measures/Instruments	Expected Results	Recommendations
Real convergence of productivity	<ul style="list-style-type: none"> <li>- Erosion of competitiveness and aggravation of external accounts;</li> <li>- investment and allocation of resources (labour) for non-tradable services;</li> <li>- Specialization in sectors of low technological intensity and weak capacity to generate knowledge adaptable to production needs;</li> <li>- Low average labour qualification and low level of innovation can hinder TFP's growth.</li> </ul>	<ul style="list-style-type: none"> <li>- Focus on the manufacturing as a driver of economic recovery</li> </ul>	<ul style="list-style-type: none"> <li>- Reduce the disparity in labour productivity in the Portuguese economy</li> </ul>	<ul style="list-style-type: none"> <li>- The convergence process in Portugal must be assisted by a reinforcement of supply-side measures with an integrated industrial policy, favouring certain industries where there is evidence of positive externalities from FDI</li> </ul>
Attract FDI and promote economic growth and employment	<ul style="list-style-type: none"> <li>- Investment policy moving from national to European level;</li> <li>- Stiff public budget;</li> <li>- Limited scope of most FDI strategies through incentives;</li> <li>- Difficulty of IPAs in identifying business opportunities for target firms.</li> </ul>	<ul style="list-style-type: none"> <li>- Encourage FDI through incentives funded by Structural Funds;</li> <li>- Special visa regime;</li> <li>- Priority industries: heavy industry; traditional industries; and industries with comparative advantage (electrical equipment, computers and electronics);</li> <li>- Transparency of public finances;</li> <li>- Promptness of judicial procedures;</li> <li>- Liberalization of the product market;</li> <li>- Improve regulation</li> </ul>	<ul style="list-style-type: none"> <li>Foreign presence may contribute to an increase of domestic firms' TFP</li> </ul>	<p>FDI policy should:</p> <ul style="list-style-type: none"> <li>- Compare the benefits of attracting FDI projects with the costs in terms of the public budget;</li> <li>- Align investor motivation with the country's development strategy;</li> <li>- Protect and enable investment liberalization by removing obstructions (Particularly in the framework of mergers and repatriation of income).</li> </ul> <p>State aid rules need to:</p> <ul style="list-style-type: none"> <li>- Adopt a sectoral and multisector approach;</li> <li>- Consider the economic impact of the project and the fulfilment of the contractual obligations;</li> <li>- Consider the tax laws of the country of origin and the agreements governing taxation between the two countries.</li> </ul>

Notes: Because the measure of technological gap is inverse, e., constructed as the ratio of labour productivity of domestic firms to foreign firms, the higher the value the greater the technological sophistication of domestic firms. Source: Author's own elaboration

### 3.1. Main Recommendations

It will be useful to highlight that the proposed intervention strategy concentrates preferentially its attention on the effort to achieve higher levels of competitiveness through increased industrial productivity. Attention has been drawn to strengthening structural change towards economic activities with high added value, since technological change appears to be the only route available to achieve economic growth. Thus, the design of public policies analysed here has a strong affiliation to the set of policy instruments established in the context of the Structural Funds. Therefore, FDI Policies need to be tailored to the specific requirements of investors (for example, in



compliance with the tax laws of investor's countries and the tax agreements between the two countries). Also, these policies should be difficult to replicate by other governments, in order that the host country will be able to attract the desirable FDI projects. Examples of such measures are the creation of hubs of firms with high-skilled workforce and/or management expertise.

Regarding the Industrial Policy, in addition to the horizontal focus that supports the whole manufacturing sector; it must also target the specific industries (vertical focus) where FDI generates positive externalities. Indeed, the quality and effectiveness of public policies analysed here, requires the assistance of supply-side measures with an integrated industrial policy, favouring scale-intensive sectors, where there is evidence of positive externalities from FDI. Hence, FDI incentives should target that technological group instead of individual firms, after performing a balance between the benefits and costs (public budget) and aligning investors' motivations with the country's development strategy.

## Conclusion

Being a small and moderately innovative economy, without the locational advantages of the CEECs, the potential convergence of the Portuguese economy is threatened due to several factors that caused a fall not only in FDI flows, but also in production and employment, which were not fully compensated by government incentives for innovation activities, which in most cases were limited.

Based on the analysis of the Innovation System indicators, although Portugal has managed to improve its innovation activities, the distance between Portugal and the EU-28 average has increased, except for the indicators related to infrastructures and inequality, and the economy has not been able to converge with that average. According to the OECD Reports (Portugal), several weaknesses persist such as the scarcity of human capital and the difficulties to adopt more modern production techniques, organizational practices and new products. Thus, the main challenge for Portugal is to increase productivity on a sustained basis. The path of sustainable growth goes through a process of structural transformation via technological change. In this context, the manufacturing sector, being one of the main producers of tradable goods and higher rates of productivity and innovation is considered the main engine of economic growth. In addition, the numerous technological linkages within the manufacturing industries enable the technological change. In this context, FDI is considered the main vehicle of technology transfer, since it represents the greatest source of innovation, (Lim 2001). A greater foreign presence within an industry is correlated with the growth of TFP of domestic firms by increasing the speed of technology transfer. Historically, FDI has contributed to the structural change of Portuguese exports to technology-intensive industrial activities.

The changes that recently occurred in industrial policy were accompanied by new strategies, such as the resumption of focus on productivity and merging with innovation policy to support research and education. In this context, the European Commission (EC) plays an important role about the Government incentive system for innovation activities in Europe, with a view to improving the competitiveness of firms. Thus, aim of this paper is to evaluate the impact of FDI inflows to manufacturing TFP in Portugal and, therefore, on the process of convergence with the EU-28 average. This exercise can provide policy recommendations to boost productivity and stimulate growth. Though, with the acceleration of globalization that began in the new millennium, FDI inflows to the Portuguese manufacturing sector have become more volatile. Thus, we analysed the joint evolution of FDI inflows to the manufacturing sector and the factor contribution to the GVA increase in the manufacturing for 1986-2016, in search of a hint on the FDI impact on the manufacturing TFP. Our analysis has shown that FDI flows targeting this sector potentially help to narrow the gap with the TFP. However, to grow and converge, Portugal needs a well-defined FDI policy that aligns investors' motives with the national development strategy; that uses the funds according to the objectives; that performs a continuous assessment to ensure its effectiveness; and makes the necessary corrections.

On the other hand, the industrial policy must reconcile the horizontal focus that supports the development of industry in general, with a vertical focus, *i.e.*, on specific sectors. This is critical for attracting FDI projects that generate positive externalities for domestic firms. In this respect, the importance of subsidiaries in job creation in 1986-2016 was greater in scale-intensive industries and in science-based industries (*e.g.*, automotive, food, rubber and plastics and chemicals). To boost productivity, an integrated industrial policy must be established, favouring scale-intensive sectors where there is evidence of positive externalities from FDI. In the past, economies of scale have encouraged technical progress in Portugal. Therefore, FDI incentives should be used to attract this technological group of industries, aligning investors' motives with the country's development strategy. In addition, the proposed intervention strategy should aim at reinforcing structural change towards high value-added economic activities, as technological change seems to be the only way available to achieve economic growth. In this context,

clusters play an important role in improving the attractiveness of a region to FDI, providing local capacities that influence the location of economic activities. In our view, it is only under these conditions that Portugal can resume the path of convergence with the EU countries.

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## APPENDIX A

Table A1. Portuguese Innovative System Database: description and basic statistics, 1986-2016 Obs = 31

Variable	Description	Unit	Mean	Std. Dev.	Min	Max	Source
Rdeu	R&D expenditure EU-28	% GDP	1.81	0.11	1.63	2.02	PORDATA
Rdpt	R&D expenditure Portugal	% GDP	0.94	0.38	0.40	1.58	PORDATA
patenteu	Patents EU-28	Number	16,713.84	7,123.95	5,526.00	26,816.00	PORDATA
patentpt	Patents Portugal	Number	214.55	207.27	54.00	722.00	PORDATA
publeu	Scientific publications EU-28	Number	1,195.06	156.07	933.00	1,526.37	OCS Ministry of Science
publpt	Scientific publications Portugal	Number	677.54	353.58	33.00	1,336.00	OCS Ministry of Science
gdpppseu	GDP PPS EU-28	pps	20,070.03	6,208.78	10,183.00	33,582.00	PORDATA
gdpppspt	GDP PPS Portugal	pps	15,803.29	4,704.40	7,713.00	25,385.00	PORDATA
tradeeu	(imports+exports) EU-28	% GDP	65.35	11.93	49.00	83.00	PORDATA
tradept	(imports+exports) Portugal	% GDP	65.22	7.03	54.01	79.90	PORDATA
graduateseu	Graduates EU-28	Number	130,635.30	26,674.09	79,526.00	180,095.00	PORDATA
graduatespt	Graduates Portugal	Number	64,688.38	18,147.94	27,182.27	94,867.00	PORDATA
eleceu	electric power consumption EU-28	Kwat	5,751.96	512.52	4,825.00	6,568.00	PORDATA
elecpt	electric power consumption Portugal	Kwat	3,839.40	1,053.64	1,974.54	5,342.17	PORDATA
ginieeu	Gini Index EU-28	Number	29.41	0.80	28.00	31.00	PORDATA
ginipt	Gini Index Portugal	Number	36.25	1.45	34.00	39.00	PORDATA

Source: Author's own elaboration.

## Causality on the Growth-Governance-Fiscal Decentralization Nexus: An Analysis of Time Series in Indonesia

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### Abstract:

This study tries to disentangle whether governance and fiscal decentralization in Indonesia improves economic growth in the period 1984 – 2014. Also, it investigates whether there is a causality in the growth-governance-fiscal decentralization nexus in Indonesia. The results run by OLS (Ordinary Least Square) and VECM (Vector Error Correction Model) provide different interpretation. However, one could argue that VECM can best describe the relationship between growth and governance as well fiscal decentralization both in short and long run since simple OLS are useful when all variables are stationary at level.

**Keywords:** governance; fiscal decentralization; growth; Indonesia

**JEL Classification:** H770; H830; O430

### Introduction

Governance has become a central issue in the literature of development theory, public policy and economics. In this context, economist and other social scientists have investigated whether some countries have better governance than the others, whether sub-national governments within countries' jurisdictions perform better than the others, and how does governance link with levels of socio-political development, size of a region or country, social trust within countries, and levels of decentralization.

A pioneer work by Kaufman and Kraay (2002) reinstates the framework of relationship between governance and growth that may be bi-directional. They argued that poor governance causes weak economic performance which in turn reinforces poor governance. Such phenomenon is called as low income governance traps. However, one of the weaknesses of their study is that they have focused on cross-country data. While this provides a large sample of countries and a relatively long time span, such studies are open to the criticism in a sense that there are important unobserved factors such as fiscal decentralization which may have an important influence on economic performance.

Concerning this situation, the purpose of the present study is to freshly explore as follows: (1) Whether governance and fiscal decentralization underpins the growth in Indonesia; (2) Whether there is causality in the governance-fiscal decentralization-growth nexus in Indonesia. To obtain the result, we introduce a governance and fiscal decentralization variable into the Solow augmented Mankiw-Romer-Weil (MRW) structural model for Vector Error Correction Model (VECM) and Vector Autoregressive (VAR) estimation for the period 1984-2014.

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## 1. Literature Review

There are several scholars who attempt to directly link fiscal decentralization and economic growth. Davoodi and Zou (1998) found that the negative effect of fiscal decentralization on economic growth exists in developing countries, but there is an insignificant contribution in developed countries. In addition, Martinez-Vazquez and McNab (2003) pointed out that there are potentially indirect effects of decentralization on growth. However, in the next study, Martinez-Vazquez and McNab (2006) failed to observe evidence of a direct relationship between decentralization and growth. However, fiscal decentralization tended to have a positive indirect effect on economic growth through its beneficial impact on price stability.

In the case of Indonesia, Ismail and Hamzah (2006 cited in Yulindra 2012) found that the expenditure indicator is positively and significantly correlated with growth, while the revenue indicator shows the opposite one. Moreover, Fadli (2014) found that fiscal decentralization has a positive impact on regional economic growth since it has the ability to reduce regional disparities in the eastern and western Indonesia.

Moving to the governance-growth nexus, there are several arguments that governance do matter for economic performance. First, the quality of economic governance, measured by the security of property rights and the level of contract enforcement, is crucial to growth and investment (Knack and Keefer 1995). Second, the subjective indexes of corruption are negatively linked with investment and economic growth (Mauro 1995). Third, efficiency in bureaucracy couples with the absence of corruption, the rule of law, and protection of property rights are important for growth (Alesina and Spolaore 1997). Last, quality of economic policy, reflected by the rationale decision of central government to tackle inflation as well as to manage budget surplus and openness in trade, do matter for erecting growth (Sugiyanto and Digdowiseiso 2017).

In the case of Indonesia, recent study conducted by McCulloch and Malesky (2011) found that there is little or no statistically significant association between many typical measures of local economic governance and the growth performance of the district. But, overall governance indicator is positively and significantly correlated with district growth when instrumenting growth with mudslides. In another perspective, Hamid (2013) found that there is a positive relationship between the mayor/regent's quality and the change of local road infrastructure.

## 2. Methodology

Measuring governance for longer time period in a country can be problematic. The World Bank Governance Indicator is established on 1996, while corruption perception index of the Transparency International is firstly launched on 1995. To bridge this gap, I used Dahlberg *et al.* (2016) on the basic quality of government data set for the period 1984-2014 (see Table 1). They basically compiled the ICRG variables of corruption, law and order, and bureaucracy quality and take the mean value of them in 0-1 scale. Higher value indicates higher quality of government.

In addition, they also compiled population growth rate from the World Bank Indicators. Meanwhile, we use trade and investment share of GDP, GDP growth rate and GDP per capita from the IMF database based on the 2015 World Economic Outlook. Also, I use the same source to obtain government expenditure share of GDP as a proxy of fiscal decentralization. Here, Murshed *et al.* (2009) stated that fiscal decentralization related to devolution which is given to local government. The size of devolution is defined as a capacity of state. In terms of national level, this indicator can best measure the size of government relative to the national economy. Meanwhile in measuring human capital, I use human capital index based on your schooling and return to education. This data is constructed by Feenstra *et al.* (2015) on Penn World Table Version 9.0.

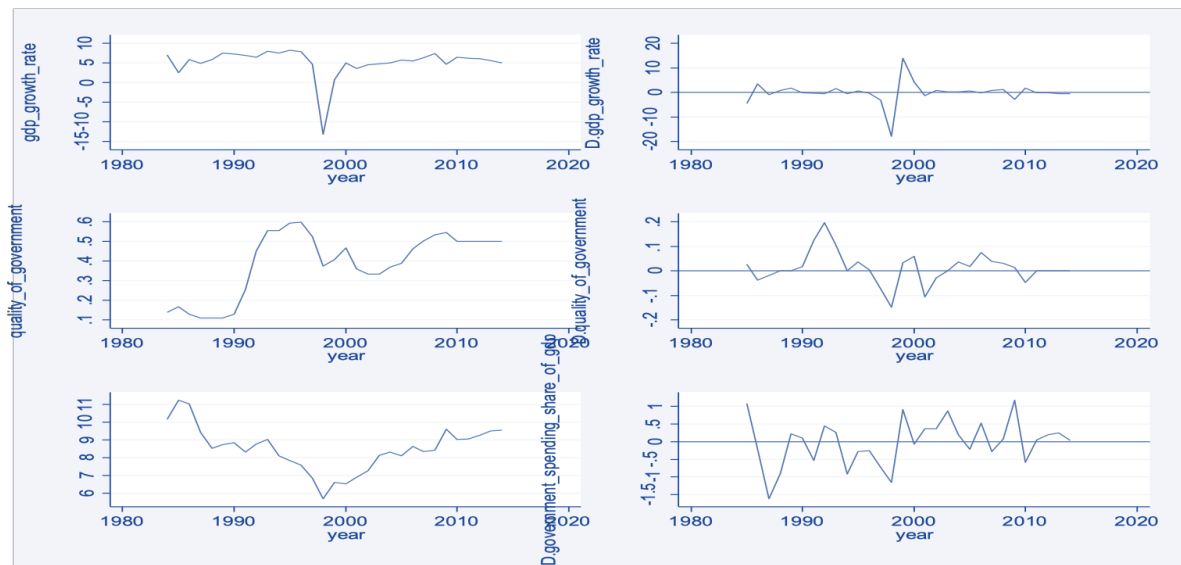
Table 1. Summary of statistic

Variable	Obs	Mean	Std. Dev.	Min	Max
year	31	1999	9.092121	1984	2014
quality_of~t	31	.3873955	.1630552	.1111111	.5972222
population~e	31	1.536282	.2757284	1.260193	2.197361
trade_shar~p	31	54.17376	10.74448	39.97386	96.1862
government~p	31	8.491936	1.244718	5.69	11.23
investment~p	31	32.15906	6.817063	13.64	44.62
gdp_growth~e	31	5.156871	3.75712	-13.127	8.22
gdp_per_ca~a	31	2.11e+07	6198423	1.23e+07	3.41e+07
human_capi~x	31	2.118407	.2308587	1.68166	2.41677



Overall, Figure 1 shows that growth rate and government size provide a wider range of variation than quality of government and they have more variance from one time period to the next. However, we do not know whether the variable is non-stationary or not.

Figure 1. Growth Rate, Quality of Government, and Government Size, 1984-2014



Mankiw, Romer and Weil (MRW) (1992) showed that with the inclusion of human capital in the production function, the explanatory power of the traditional Solow growth model is significantly improved. I use the MRW work and extend the Solow model to include governance and fiscal decentralization as a determinant of the multifactor productivity.

For simplicity, I will consider an economy that produces only one good. Output is produced with a well-behaved neoclassical production function with positive and strictly diminishing marginal product of physical capital. This condition ensures that the marginal products of both capital and labor approach infinity as their values approach zero, and approach zero as their values go to infinity.

The Solow augmented Mankiw-Romer-Weil (MRW) model is used as a basis for this study. The production function incorporating the size and quality of the government is of the Cobb-Douglas form:

$$Y(t) = K(t)^\alpha H(t)^\beta [G(t) QoG(t) L(t)]^{1-\alpha-\beta} \tag{1}$$

where:  $Y(t)$  is the aggregate level of real income,  $K(t)$  is the level of physical capital, and  $H(t)$  is the level of human capital.

The size dimension of the government  $G(t)$  is measured by the level of government expenditure,  $L(t)$  is the amount of labour employed, and  $QoG(t)$  measures the quality dimension of the government.

Let  $0 < \alpha < 1$ ,  $0 < \beta < 1$ , and  $\alpha + \beta < 1$ . These conditions ensure that the production function exhibits constant returns to scale and diminishing return to each point. Time is indexed by a continuous variable ( $t$ ). With the omission of the governance term, the model yields standard neoclassical results. That is, the growth rate of output per capita is accelerated with increases in investments in physical capital and decreases in population growth, depreciation rate of capital, and the initial level of output per capita.

This paper adopts Solow Augmented Mankiw-Romer-Weil (MRW) model because it permits the inclusion of more policy variables in economic growth equation. Specifically, the model was modified to include governance and fiscal decentralization as one of its explanatory variables. There are various channels through which governance and fiscal decentralization affects economic growth. But this study adopts five (5) transmission channels which are investment, human capital, trade, population growth and initial level of GDP per capita. Thus, my specification is formulated as follows:

$$GROWTH_t = \alpha_0 + \alpha_1 LGDPPC_t + \alpha_2 QOG_t + \alpha_3 GOV_t + \alpha_4 (QOG * GOV)_t + \alpha_5 INV_t + \alpha_6 TRADE_t + \alpha_7 HCT + \alpha_8 POPT + \mu t \tag{2}$$

where:  $GROWTH_t$  is GDP growth rate at time  $t$ ,  $LGDPPC_t$  is natural logarithm of GDP per capita at time  $t$ ,  $QOG_t$  is quality of government as a proxy of governance at time  $t$ ,  $GOV_t$  is government size as a proxy of fiscal

decentralization at time  $t$ ,  $INV_t$  is total investment share of GDP at time  $t$ ,  $TRADE_t$  is total trade share of GDP at time  $t$ ,  $HC_t$  is human capital index at time  $t$ , and  $POP_t$  is population growth rate at time  $t$ .

To capture indirect effect of governance on economic growth through fiscal decentralization, I put interaction term between quality of government and government size.

Since this study will employ quantitative tools of data analysis, there are several estimation techniques, as follows: First, The Augmented Dickey-Fuller (ADF) unit root test will be used to test for stationarity; Second, a cointegration test will be conducted to determine if the time series variables have a long-term or equilibrium relationship between them; Third, the Vector Error Correction Model (VECM) will then be used to reveal the short-run dynamics in the economic growth function; Fourth, the Vector Autoregressive (VAR) Granger Causality test will be conducted to ascertain the causal relationship between governance, fiscal decentralization, and economic growth; and Lastly, impulse-response analysis is performed based on VAR estimation.

### 3. Results

The univariate characteristics of the data was analysed using the Augmented Dickey Fuller (ADF) tests to establish the order of integration, since the actual datagenerating process is not known. The result of the ADF test for all the variables used in our estimations is reported in Table 2. The first column shows the list of all the variables that are tested. The second column (model) shows whether the equation that is estimated for the testing purpose involves a trend and a constant, a constant only, or neither a constant nor a trend. The third column shows the number of lags that are used for each model and they are significant at the 5 percent level. The fourth and fifth column is the ADF level and ADF first difference. To sum up, our variable is mostly unit root and non stationary. The first differencing of variable will make stationary of the data.

Table 2. ADF Test

Series	Model	Lags	ADF level	ADF first difference
Growth	Intercept	0	-0.7060854*	-1.279816*
	Trend + Intercept	0	-0.7059555*	-1.27895*
	None	0	-0.252788*	-1.279992*
Gdppc	Intercept	0	-0.0028099	-0.7494067*
	Trend + Intercept	0	-0.1670036	-0.7488835*
	None	0	0.0020116*	-0.4072733*
Qog	Intercept	0	-0.1096143	-0.5595906*
	Trend + Intercept	1	-0.2146766	-0.7164658*
	None	0	0.0101048	-0.5423137*
Gov	Intercept	0	-0.1525986	-0.92589*
	Trend + Intercept	0	-0.1298563	-1.025022*
	None	0	-0.0055128	-0.9228597*
Qog*Gov	Intercept	0	-0.1148616	-0.6868317*
	Trend + Intercept	0	-0.2051053	-0.6866055*
	None	1	-0.0054604	-0.7684044*
Inv	Intercept	0	-0.1987467	-1.012078*
	Trend + Intercept	0	-0.2245747	-1.015787*
	None	0	-0.0083892	-1.012122*
Trade	Intercept	0	-0.493702*	-1.451073*
	Trend + Intercept	0	-0.5063325	-1.460634*
	None	0	-0.0180472	-1.451006*
HC	Intercept	0	-0.0469085*	-0.044225
	Trend + Intercept	0	0.193482*	-.2438141
	None	0	0.0100384*	-0.06949
Pop	Intercept	0	-0.0892034*	-0.0894816
	Trend + Intercept	0	-0.0729511*	0.2222373
	None	0	-0.0222699*	-0.067312*

Most of the estimated coefficient in equation 1 are statistically significant, particularly related to variable of interest such as governance. However, the variable of government size as measure of fiscal decentralization is negative and insignificant. In addition, the inclusion of interactive term (QoG\*Gov) changes the size and magnitude of primary variable such as quality of government, while coefficient of government size remains negative and



insignificant. Overall, there is clear evidence of no autocorrelation in the residuals of all model, the data are homoskedastic in all model, but growth has non-normal characteristic.

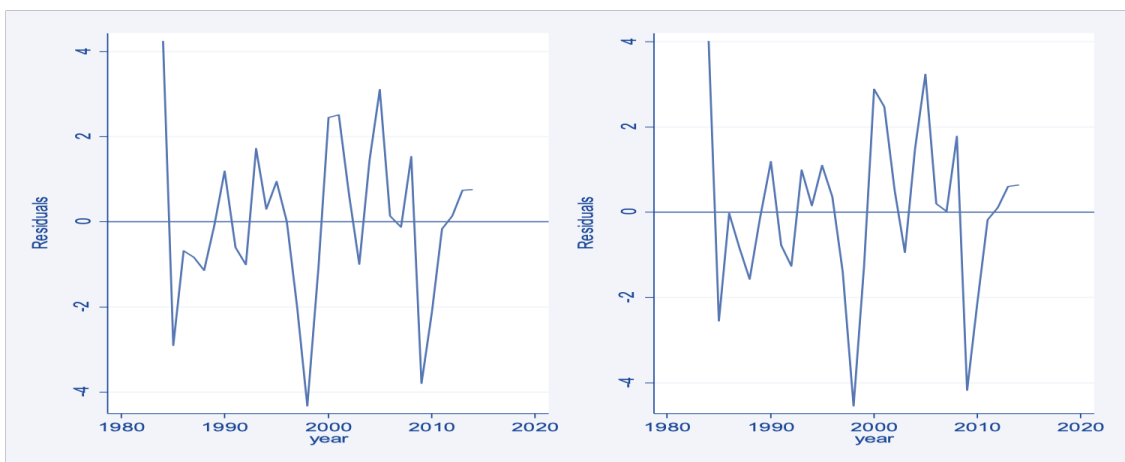
Table 3. Simple Growth Regression result

Variable	Growth (1)	Growth (2)
Lgdppc	-14.39826** (6.64201)	-14.60747** (6.719124)
Qog	11.74208** (4.842736)	32.93195 (29.86545)
Gov	-0.966447 (0.9256742)	-0.0705299 (1.557848)
Qog*Gov	-	-2.524565 (3.51007)
Inv	0.1950334** (0.0964562)	0.2236059** (0.1052684)
Trade	-0.3534769* (0.075016)	-0.3539368* (0.0758184)
HC	15.69284 (13.20575)	16.09193 (13.35808)
Pop	-0.7965957 (11.65478)	-2.324549 (11.96908)
Resid	-0.8821708* (0.1729885)	-0.8647713* (0.1703678)
Adjusted R2	0.6601	0.6529
LM tests (Prob>Chi2)	0.4898	0.4250
White test	0.4154	0.4154
Normality Test		
Skewness	0.0000*	0.0000*
Kurtosis	0.0000*	0.0000*
J-B	0.0000*	0.0000*
No. of Observation	31	31

Notes: Number of parentheses are robust standard error where \*\*\* = significant at 1 percent level, \*\* = significant at 5% level, and \* = significant at 10% level.

Meanwhile, in Figure 2, the essence of co-integration test is to find out if there is a long term relationship between variables that are stationary at different levels of integration. The cointegrating relation is found to be appropriate since the graph reverts to the equilibrium. Also, the evident from Table 3 on the estimated coefficient of Resid confirms that the relationship between Growth and other explanatory variables are valid (no spurious regression) in the long run.

Figure 2. Cointegrating relation in growth equation



Arming with the message from Table 3, the lag order selection criteria was conducted and can be seen in table 4. The maximum lag structure that is used follows Said and Dickey (1984), who suggested a lag order equal to  $T^{1/3}$ . T is the number of observations, which in this case is 31 years (1984 to 2014). Therefore, the maximum lag

structure of 3 is used in the testing procedure. From the selection criteria, it is seen that the lag of three (3) had more number of selection as it was selected by five (5) criteria in all models. Therefore, the number of lagged terms included was three (3).

Table 4. Lag Order Selection criteria

	Lag	LL	LR	FPE	AIC	HQIC	SBIC
Growth (1)	0	-52.8614		4.59848	4.34725	4.46361	4.72788
	1	-52.7194	0.28413	4.92474	4.40853	4.53943	4.83673
	2	-48.8835	7.6716*	4.05934	4.20597	4.35142	4.68176
	3	-47.0741	3.619	3.87639*	4.14815*	4.30815*	4.67151*
Growth (2)	Lag	LL	LR	FPE	AIC	HQIC	SBIC
	0	-50.6697		4.25402	4.26212	4.39303	4.69033
	1	-50.3887	0.56196	4.52008	4.31348	4.45893	4.78927
	2	-47.95	4.8774	4.12668	4.21072	4.37071	4.73408
3	-43.905	8.0901*	3.36855*	3.99321*	4.16776*	4.56416*	

By using the lag order selection criteria, I will test whether I use VECM as my estimation model. To do this, I have to employ Johansen cointegration technique in standard growth model 1. If the variables are non cointegrated, we cannot run VECM model, instead we deploy unrestricted VAR model. From Table 5, it is clear that there are approximately five and six cointegration among variables by looking at trace statistic and maximum statistic.

Table 5. Johansen Tests for Cointegration

Trend: constant				Number of obs = 28			
Sample: 1987 - 2014				Lags = 3			
maximum				trace	5% critical	1% critical	
rank	parms	LL	eigenvalue	statistic	value	value	
0	105	130.10526		1035.8242	124.24	133.57	
1	118	502.90878	1.00000	290.2172	94.15	103.18	
2	129	576.50137	0.99479	143.0320	68.52	76.07	
3	138	602.49377	0.84380	91.0472	47.21	54.46	
4	145	623.9834	0.78454	48.0679	29.68	35.65	
5	150	639.04274	0.65893	17.9493*1	15.41	20.04	
6	153	647.55329	0.45550	0.9282*5	3.76	6.65	
7	154	648.01737	0.03261				
maximum				max	5% critical	1% critical	
rank	parms	LL	eigenvalue	statistic	value	value	
0	105	130.10526		745.6070	45.28	51.57	
1	118	502.90878	1.00000	147.1852	39.37	45.10	
2	129	576.50137	0.99479	51.9848	33.46	38.77	
3	138	602.49377	0.84380	42.9793	27.07	32.24	
4	145	623.9834	0.78454	30.1187	20.97	25.52	
5	150	639.04274	0.65893	17.0211	14.07	18.63	
6	153	647.55329	0.45550	0.9282	3.76	6.65	
7	154	648.01737	0.03261				

From Table 6, the results from the core specification confirm that natural logarithm of GDP per capita, governance, fiscal decentralization, investment, and trade are highly significant determinants of economic growth in Indonesia. Adding the interactive effect between governance and fiscal decentralization will make all variables become statistically significant. Related to our variable of interest, both governance and fiscal decentralization are negatively correlated with economic growth in model I. However, after adding interactive term, both the estimated coefficient of governance and fiscal decentralization are positively correlated. Thus, the need to incorporate better governance in fiscal decentralization is very essential for stimulating economic growth in Indonesia.

Table 6. VECM results

Variable	Growth (1)	Growth (2)
Lgdppc	19.12395* (5.468267)	2.504142* (0.0262903)
Qog	-9.569524* (1.73925)	21.03887* (0.0477763)
Gov	-1.68108** (0.8861396)	1.090431* (0.0029079)

Variable	Growth (1)	Growth (2)
Qog*Gov	-	-2.462301* (0.0051345)
Inv	-0.3178941* (0.0651215)	0.0138242* (0.0002147)
Trade	-0.1351246*** (0.0815683)	-0.0158006* (0.0004876)
HC	-3.157209 (15.90527)	-10.55991* (0.0731121)
Pop	20.71827 (6.44787)	-6.791041* (0.0196513)
No. of observation	28	28

Notes: Number of parentheses are robust standard error where \*\*\* = significant at 1 percent level, \*\* = significant at 5% level, and \* = significant at 10% level.

There is empirical evidence that growth is contemporaneously correlated with governance and fiscal decentralization (see Kauffman and Kraay, 2002; Kyriacou and Roca-Sagales, 2011). However, many also believe that there is potential endogeneity on fiscal decentralization and government quality (see de Mello and Barenstein, 2001, Altunbas and Thornton 2012, Sugiyanto *et al.* 2018). This section to investigate whether there is a causal relationship between these variables and if there exists such relationship, is it a unidirectional or bilateral causality?

We consider the following VAR equation such that

$$GROWTH_t = \alpha_0 + \alpha_1 GROWTH_{t-1} + \alpha_2 QOG_{t-1} + \alpha_3 GOV_{t-1} + v_{1t} \tag{3}$$

$$QOG_t = \alpha_0 + \alpha_1 QOG_{t-1} + \alpha_2 GROWTH_{t-1} + \alpha_3 GOV_{t-1} + v_{2t} \tag{4}$$

$$GOV_t = \alpha_0 + \alpha_1 GOV_{t-1} + \alpha_2 GROWTH_{t-1} + \alpha_3 GOV_{t-1} + v_{3t} \tag{5}$$

And we start to use the same criterion in selecting the maximum lag order, which is three (3). From the selection criteria in Table 7, it is seen that the lag of three (3) had more number of selection as it was selected by three (3) criteria in all models. Therefore, the number of lagged terms included was three (3).

Table 7. Lag Order Selection criteria

(1)	Lag	LL	LR	FPE	AIC	HQIC	SBIC
Growth	0	-97.0298		.254474	-1.58293	-1.58293	-1.58293
QoG	1	-49.6398	94.78	.016492	-4.32507	-4.1942*	-3.8969*
Gov	2	-41.4099	16.46	.017894	-4.27007	-4.00825	-3.41365
	3	-28.5727	25.674*	.014537*	-4.5441*	-4.15143	-3.25953

The result from Table 8 indicates that the three lagged values of governance and fiscal decentralization does not cause economic growth. Similarly, the three lagged value of growth and governance does not cause fiscal decentralization. However, the three lagged values of economic growth cause governance.

Table 8. Granger Causality Wald tests (Three Lagged)

Equation	Excluded	F	df	df_r	Prob > F
gdp_growth_rate	quality_of_gove~t	.8443	3	18	0.4874
gdp_growth_rate	government_spen~g	.77996	3	18	0.5204
gdp_growth_rate	ALL	1.09	6	18	0.4053
quality_of_gove~t	gdp_growth_rate	3.6338*	3	18	0.0329
quality_of_gove~t	government_spen~g	.6106	3	18	0.6168
quality_of_gove~t	ALL	1.8424	6	18	0.1471
government_spen~g	gdp_growth_rate	.79047	3	18	0.5149
government_spen~g	quality_of_gove~t	.58099	3	18	0.6351
government_spen~g	ALL	.51171	6	18	0.7917

When we change the number of lags into 7, clearly the results changes dramatically in terms of p-value. For example, in Table 9, the seven lagged of governance and fiscal decentralization cause economic growth. Similarly, the seven lagged of growth and fiscal decentralization cause governance. So, there is a bi-directional relationship

between growth and governance. Also, fiscal decentralization has unilateral relationship with growth and governance.

Table 9. Granger Causality Wald tests (Seven Lagged)

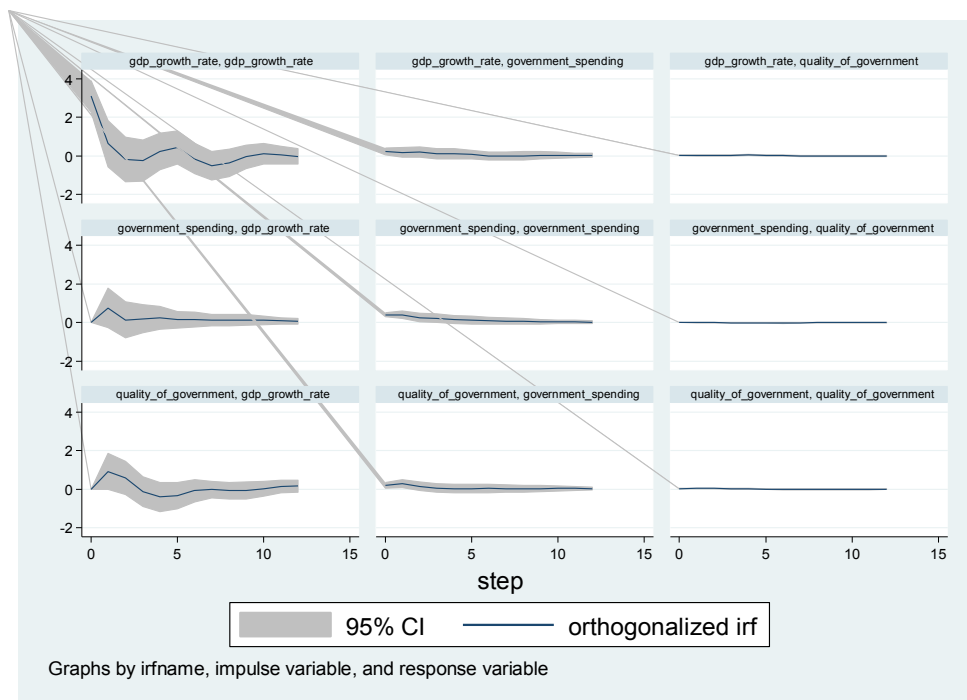
Equation	Excluded	F	df	df_r	Prob > F
gdp_growth_rate	quality_of_gove~t	156.98*	7	2	0.0063
gdp_growth_rate	government_spen~g	107.47*	7	2	0.0092
gdp_growth_rate	ALL	140.83*	14	2	0.0071
quality_of_gove~t	gdp_growth_rate	12.448*	7	2	0.0764
quality_of_gove~t	government_spen~g	8.5714*	7	2	0.1004
quality_of_gove~t	ALL	14.786*	14	2	0.0651
government_spen~g	gdp_growth_rate	.54609	7	2	0.7707
government_spen~g	quality_of_gove~t	.46857	7	2	0.8111
government_spen~g	ALL	.75158	14	2	0.7042

Impulse response function (IRF) in time series analysis is important in determining the effects of shocks on the variables of the system. Put it simply, IRF shows how changes in one variable at the beginning affect another variable through time. It also investigates the response of a variable to shocks from itself and other variables in the VAR model.

Of paramount importance in the analysis of IRF, is how variables respond to innovations or shocks in other variables and shocks from itself within the same VAR model. Thus, we set to investigate the relationship between growth and governance as well as fiscal decentralization by investigating the responses of these various time series variables to shocks from each other and also themselves.

Moving to Figure 3, fiscal decentralization responds positive to its innovations and shocks in the first period but as it enters the second period, it declines and is fairly constant till the end. Similar situation takes place in growth where it responds highly positive in the beginning to its innovations and shocks, before starts to decline in third and seven period. From eleven periods onward, growth is relatively stable. Meanwhile, governance response to its innovations and shocks is relatively constant from the beginning to the end. Similarly, economic growth and fiscal decentralization in Indonesia remain stable to innovations and shocks in governance at a fairly constant rate over periods of time. Also, governance and fiscal decentralization in Indonesia responds highly positive in the second period to innovations and shocks in economic growth, before starts to stable in the third period and seventh period, respectively.

Figure 3. IRF based on VAR estimation



## Conclusion

This study departed from two simple questions. Does governance and fiscal decentralization in Indonesia improves economic growth? And is there any evidence of reverse causality between governance and growth, fiscal decentralization and growth, as well as fiscal decentralization and governance?

The simple OLS and VECM on growth regression provide different result. In the former, governance is positively correlated with growth. However, the estimated coefficient of fiscal decentralization is negative and insignificant. The inclusion of interactive term (QoG\*Gov) changes the size and magnitude of primary variable where governance becomes insignificant, while coefficient of government size remains negative and insignificant.

In the latter, both governance and fiscal decentralization initially are negatively correlated with economic growth. However, after adding interactive term, both the estimated coefficient of governance and fiscal decentralization are positively correlated. From this explanation, simple OLS are usefull when all variables are stationary at level. However, since some exogenous variables are stationary at the first difference, thus VECM can best describe the relationship between growth and governance as well fiscal decentralization both in short and long run.

The distinctive feature of this study is the significant role played by governance and fiscal decentralization in explaining the long-term pattern of economic growth in Indonesia. The results from the long-run estimation and the impulse responses revealed the fact that a good governance couple with better implementation of fiscal decentralization will boost economic growth over the long-run period. Future research should attempt to correct some of the shortcomings of this study. The lack of available long-term series on governance rating must be addressed, and this may give a better parameter estimate of the effect of governance on economic growth.

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## Multi-Criteria Decision Analysis of Socio-Economic Factors of Tax Evasion

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### Abstract:

The aim of the article is to evaluate the riskiness of selected socio-economic factors that impact tax evasion and determine the ranking of selected EU countries according to the severity of the risk of tax evasion. Given that the main causes stem from the country's tax system, the concept of the tax system and its mechanisms are influenced by the tendency of taxpayers to comply with tax rules or, on the contrary, they are the reason for their non-compliance in the form of tax avoidance and tax evasion. The impact of selected factors (namely tax burden, tax relief, unemployment and the complexity of the tax system) on tax evasion is analysed in the article. Data is used from publicly available Eurostat, OECD, SBA Agency, World Bank and PricewaterhouseCoopers databases and sources. The data obtained are then analysed using multi-criteria decision analysis. The results reflect the overall pattern of tax systems of selected EU countries with a focus on personal income tax, corporate tax and indirect taxes, in terms of the tax system's riskiness related to tax evasion.

**Keywords:** socio-economic factors; tax evasion; tax system; tax burden; risk

**JEL Classification:** H26; K34

### Introduction

The effort of taxpayers to reduce the tax burden is a common phenomenon in the current economic environment. The fraudulent reduction or payment of taxes and other compulsory payments of taxpayers also pose a certain competitive advantage towards those entrepreneurs who are within the full legal scope of the tax and other obligations burden, and who even have to compensate for the losses caused by those who unjustifiably reduce the tax. The reason for imposing a sanction does not only have to be a deliberate reduction of tax, but also a low level of knowledge in tax law (Šimonová 2017), a lack of information, the improper knowledge of taxpayers of a changed economic environment, or ignorance of the possibilities of the pertaining laws. Tax evasion is a serious problem that needs to be given due attention, as the evasions that arise have a negative impact on the state budget and the stability of the economy. This area is important for all citizens and not just for entrepreneurs. Few people realize that the owed tax will be paid by everyone again through taxes in the end. Taxes are the most important source of revenue for the state, and if the state fails to collect all taxes to a sufficient extent, the tax gap leads to a negative impact on the basic functions of the state, the deterioration of state services provided to citizens and entrepreneurs, the deterioration of the competitive environment. Then, taxes may even be increased and thus again paid by taxpayers.

Recently, the abuse of the tax system, which is conditional on various factors, is being more and more analysed. Although a clear and comprehensive definition of tax evasion factors is lacking, the most common are economic, political, legislative, psychological and ethical-moral factors (Babčák 2017, Davies et al. 2018, Kubátová 2015, Lenártová 2000). The authors differ in the definition of specific factors. For this reason, there is a number of researches focused on selected aspects of the causes of tax evasion either in selected countries (e.g., Gangl et al. 2016, Mohd Yusof and Lai 2014, Torgler 2003) or between countries (for example Torgler 2012, Alm and Torgler 2006, Hofmann et al. 2017, Williams and Horodnic 2015), with more research being focused rather on individuals as taxpayers than on "corporate taxpayers". In any case, the individual factors of these causes of tax evasion are interconnected (Babčák 2017).

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The aim of the article is to assess the riskiness of selected socio-economic factors (tax burden, tax relief, unemployment and the complexity of the tax system) that affect the behaviour of taxpayers by entering the taxpayers' decision processes during tax evasion and to determine the ranking of selected European Union countries according to the severity of the risk.

## 1. Research Background

There are three basic terms in the literature regarding cases of non-payment of taxes, namely tax evasion, tax fraud and tax avoidance. Despite the fact that none of these forms of unlawful conduct in the field of taxation is legally defined, for example in Slovakia or in the Czech Republic, the tax system of the European Union Member State concerned is particularly abused in an unlawful manner in any case, although in the case of tax avoidance, within the limits of the law (Babčák 2017). In addition, it is also possible to encounter related terms, such as tax optimization, aggressive tax planning, tax advantage and so on. The magnitude of the consequences of the abuse of tax systems cannot be quantified due to their high latency. Most often tax evasion estimates are made. Tax controls allow for a straightforward determination of tax evasion in controlled entities, whereas the extent of latent tax evasion can only be estimated.

European Union Member States use several methods to determine the extent of tax evasion, but even through these methods the value for each EU country is hard to be quantified. The total amount of tax evasion in the European Union is publicly accessible and published, reaching up to € 250 billion a year, which is about 2.5% of GDP (Lang *et al.* 2018). Similarly, it is also demanding to clearly define the factors that lead to tax evasion. Davies *et al.* (2018) outlined four socio-economic factors that are currently considered to be the most important in terms of impact on tax evasion, namely tax burden, tax relief, unemployment and the complexity of the tax system.

### 1.1 Tax Burden

The tax burden is one of the socio-economic factors of tax evasion and it is a logical prerequisite for eliminating tax evasion, particularly in the case of a disproportionately high tax burden on taxpayers - individuals as well as businesses. In the field of direct taxation, unlike indirect taxes, the size of tax burden is obvious, thanks to the transparency of direct taxes. The great advantage of personal income tax is that by the origin of the subject of the tax, the source of its payment is generated at the same time. The largest share of taxable income is occupational income, but the employee is taxed by the employer, which limits tax evasion of various kinds (Zhuk 2017). Direct taxes include corporate tax, where progressivity is not necessary, creating a prerequisite for reducing tax evasion tendencies due to different tax rates. Table 1 shows an overview of the personal income tax rates and corporate income tax rates in selected EU member states.

Table 1. Income tax rates of selected EU Member States as of 1 January 2017 (in %)

State	Personal income tax rate	Corporate income tax rate
Austria	0 - 50	25
Belgium	25 - 50	33.99
Czech Republic	15	19
France	0 - 40	33.33
Germany	15 - 45	15
Hungary	36	16
Poland	19 - 40	19 (15)
Slovak Republic	19	21

Source: European Commission (2017a)

In case of personal income tax, the most heavily burdened are Belgium, Austria and Germany. On the contrary, the Czech Republic is the country with the lowest tax burden. The countries with higher corporate income rate are Belgium and France, the lowest rate is in Germany and Hungary.

For comparison of the tax burden of selected EU countries, information from the "Paying Taxes 2018" study by the World Bank and PricewaterhouseCoopers was used, which covers the period from June 2016 to June 2017, based on the state of legislation in force on 31 December 2016 (Table 2). Ease of Doing Business examines all taxes, levies and fees that have an impact on a company's real cash flow, expressed by the indicator the total tax and contribution rate (TTCR). Therefore, these data may be considered to be more complex data than the corporate income tax rate that is commonly used in international comparisons.



Table 2. Total tax and contribution rate of selected EU Member States in 2017 (in %)

State	Total tax and contribution rate
Austria	51.6
Belgium	58.6
Czech Republic	50.0
France	62.8
Germany	48.9
Hungary	46.5
Poland	40.5
Slovak Republic	51.6

Source: Own processing according to World Bank, PWC (2018)

The global average TTCR was 40.5% for this period, and it remained relatively stable for several years. Poland has the lowest TTCR, while Belgium and France the highest.

The situation with indirect tax is more complex and less clear, and tax evasion occurs more frequently. One of the conditions for EU membership was the determination of value added tax, which affected states that are aspiring members of the EU and strengthened the supporters of this tax in other countries. Value added tax (VAT), among other issues, significantly increases the success rate of taxation of services where there is generally more possibility of tax evasion. One-off turnover taxes require a differentiation of service users depending on whether it is final consumption or a production service, making it easier for some tax evasion (Enste 2018). Value added tax fails mainly for services where it is difficult to identify the added value itself, such as primary financial services, which are usually not subject to tax (Schratzenstaller *et al.* 2017).

Notwithstanding many measures in the area of value added tax, this tax appears to be the riskiest in terms of tax evasion. For example, according to data provided in the Annual Report on the Activity of the Financial Administration of the Slovak Republic for 2017 (Financial Directorate of SR 2018), VAT has the highest share (78.4%) in the total value of the controls for 2017. One of the factors behind VAT evasion can be the VAT rate (Gajdoš 2017). A lower VAT rate is more tolerable and there is a greater willingness to pay this tax, while with the increase of the rate, the effort for tax evasion also increases. The basic VAT rate varies from 17% (Luxembourg) to 27% (Hungary) in the EU Member States. The current VAT rates in the EU countries surveyed in 2017 are shown in Table 3.

Table 3. VAT rates applied in selected EU Member States as of 1 January 2017 (in %)

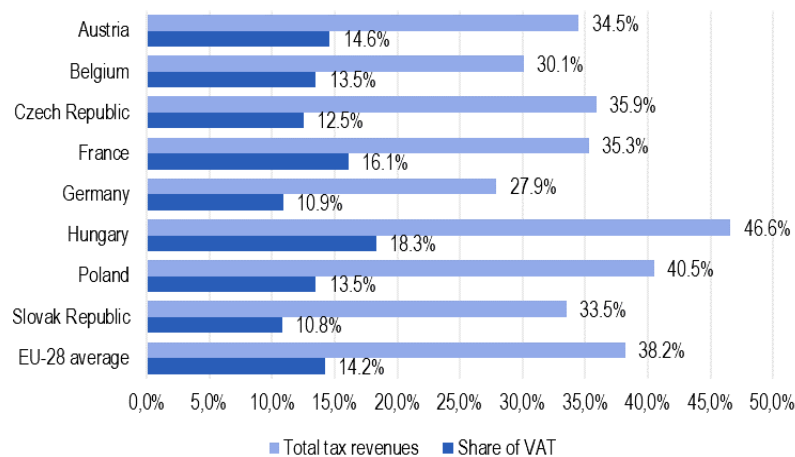
State	Standard rate	Reduced rate*	Super reduced rate	Parking rate
Austria	20	10/13	-	13
Belgium	21	6/12	-	12
Czech Republic	21	10/15	-	-
France	20	5.5/10	2.1	-
Germany	19	7	-	-
Hungary	27	18/5	-	-
Poland	23	5/8	-	-
Slovak Republic	20	10	-	-

Note: \* One or two reduced rates are applied.

Source: European Commission (2017b)

The countries analysed in this research have multiple VAT rates and therefore it cannot be clearly stated in which the burden is highest, and it is also difficult to estimate the amount of tax evasion. The significance of all VAT on the economy and public budgets stems from their share of gross domestic product and total tax revenues (Graph 1).

Graph 1. Share of VAT of countries in the total tax revenues in 2017



Source: Own processing according to SBA Agency (2017), OECD (2017)

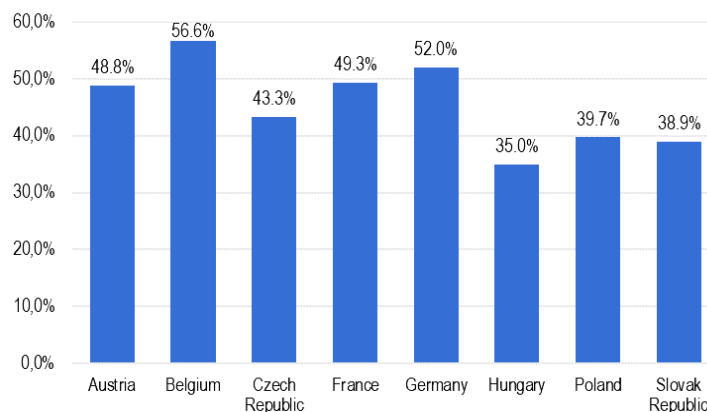
The share of indirect taxes in total tax revenues ranged from 27.9% in 2017 and was 38.2% on average in the EU-28. Overall, however, the difference between the actual VAT collected and the total VAT liability is estimated. The VAT revenue loss in the EU in 2016 are estimated at EUR 147.1 billion, representing a loss of 12.3% of the total expected VAT revenue (European Commission 2018).

In addition to VAT, consumption taxes are also part of indirect taxes and is the important source for public budgets in the EU countries.

## 1.2 Tax relief

In general, the basis for personal income tax is the total taxable income reduced by deductible items, which, apart from the tax rebate and the zero rate for the lowest tax bracket, are the main methods of tax relief. In some countries, income splitting (that is, taxing spouses or household members as if they all had the same income) and other deductible items are used as a way of granting tax relief. Personal income taxes typically include a number of such rebates that take account of the taxpayer's social status and their family situation. It is precisely the large number of such reductions that make the tax system of the Member States complicated and unclear, thus allowing tax evasion. The Graph 2 shows the comparison of tax relief of analysed countries.

Graph 2. Comparison of total tax relief in selected EU countries for 2017 (in % of wage costs)



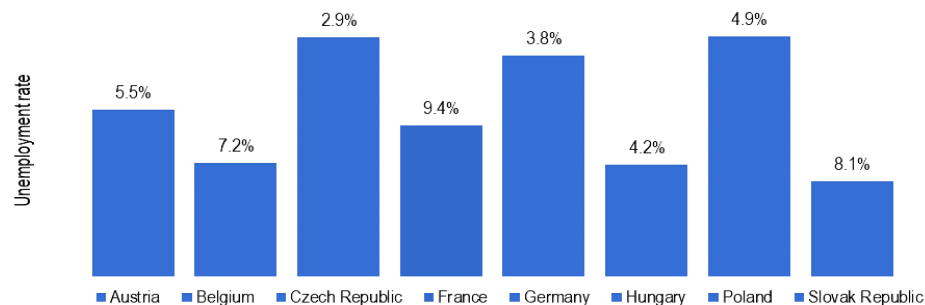
Source: Own processing according to OECD (2017)

In the Graph 2, the amount of tax relief in selected European Union countries is showed. If it is argued that the higher the tax relief is, the more complicated and unclear the tax system is, hence the higher the possibility of tax evasion, then the Graph 2 shows Belgium and Germany as countries with a higher threat of tax evasion based on their tax relief criteria. Behind them is France and the best are Slovakia and Hungary, with the least amount of tax relief.

### 1.3 Unemployment

High labour taxation has a negative impact on unemployment, and more “off-the-books” work appears, thus increasing tax evasion. The unemployment rate is presented in Graph 3.

Graph 3. Unemployment rate in selected EU countries for 2017



Source: Own processing according to OECD (2017)

The country with the highest unemployment rate is France, followed by Slovakia and Belgium. According to this criterion, France is the country with the highest risk of tax evasion.

### 1.4 Complexity of the tax system

To compare the complexity of EU countries tax systems, information from the "Paying Taxes 2018" study by PricewaterhouseCoopers and the World Bank was used, which processed the period from June 2016 to June 2017, while being based on the state of legislation in force on 31.12.2016. The study compares the Total tax and contribution rate, total tax time and total tax payments for the three tax types: profit taxes, labour taxes, other taxes (consumption taxes). All these indicators then determine the overall benefit of the tax system shown in Table 5 for each country, while in the current year of Paying Taxes 2018, a post-filing index was included in the calculation. That is to say, the post-tax processes for recovering tax overpayments were also examined, namely VAT refunds and correction of the corporate tax error, including any audit of the resulting tax. Overall paying taxes ranking is presented in Table 4.

Table 4. Overall Paying taxes ranking

State	Rank
Austria	39
Belgium	59
Czech Republic	53
France	54
Germany	41
Hungary	93
Poland	51
Slovak Republic	49

Source: Own processing according to World Bank, PWC (2018)

As can be seen in Table 4, Hungary, with the most complex tax system (ranked the last in the countries surveyed), is the country that provides the most motivation for high tax evasion, according to the criterion of the complexity of the tax system.

## 2. Methodology

The article compares the tax systems of selected European Union countries with regard to the risk of tax evasion. For this comparison, eight EU Member States were selected, namely: Austria, Belgium, the Czech Republic, France, Germany, Hungary, Poland, and the Slovak Republic.

When comparing the countries' tax systems, all payments of a tax character included in the classification of taxes according to the OECD 21 (OECD, 2017) methodology are considered as tax in the European Union. The article focuses on the following tax groups:

- Direct taxes: (Personal income tax, corporate tax).
- Indirect taxes: (VAT).

Data on the level of individual tax rates of selected EU countries were drawn up and supplemented by statistics. To assess the significance of the risk factors of tax systems, a weighted-order multichannel evaluation expert method based on partial evaluations of individual variants has been used in relation to the individual evaluation criteria and determines the ranking of the different variants in relation to these criteria.

An expert team of 12 experts was created to deal with tax issues in the commercial sphere as well as in the public sector. The anonymous survey was conducted in the form of questionnaires entitled: "Expert risk assessment with an impact on tax evasion". The task of the expert team was to assess the severity of the selected risks.

Experts were assigned credibility weights to distinguish a diverse level of the information or knowledge of the experts. The weight of the credibility of scientific experts is perceived as the ability to assess the selected risks. Ability is determined by the level of the highest level of education (higher education level 2 and 3 with economic or legal orientation) and by experience (number of years of practice) as available input information from the questionnaire. Weight assignment is shown in Table 5.

Table 5. Risk assessment

Education and Experience	Weight $V^{Ed}$
Higher education (2 <sup>nd</sup> degree) and 3-5 years of experience in tax matters	0.2
Higher education (2 <sup>nd</sup> degree) and 6-10 years of experience in tax matters	0.3
Higher education (2 <sup>nd</sup> degree) and 11-15 years of experience in tax matters	0.4
Higher education (min. 2 <sup>nd</sup> degree) and more than 15 years of experience in tax matters	0.5

Source: Own processing

The assessment of the selected risk factors for tax evasion was performed using a scale of 1 to 10 points, where 1 point means the lowest risk and 10 points the highest risk of tax evasion. The points obtained were multiplied by the respective weights. The risk assessments by experts with aggregated weights ( $U_{ir}$ ) were based on the following equation (1):

$$U_{ir} = V^{Ed} \times R_i \tag{1}$$

where:  $U_{ir}$  is the value of risk with aggregated weight,  $V^{Ed}$  is weight,  $R_i$  is risk.

Totals were created within the rows that were entered into the column: Overall risk assessment ( $C_{ir}$ ), equation (2):

$$C_{ir} = \sum U_{ir} \tag{2}$$

where:  $C_{ir}$  is overall risk assessment;  $U_{ir}$  is the value of risk with aggregated weight.

The higher the overall assessment is, the higher the risk is. The last step was to determine the risk order (P). The overall analysis is based on the interconnection of the results, which were found in two analyses, where we calculated  $\Sigma$  of the total risk assessment ( $C_{ir}$ ), i.e. 100 points. The  $\Sigma$  was used to determine the weights of individual risks. Risk weights have a maximized character, i.e. the higher the weight, the greater the risk that leads to tax evasion, equation (3):

$$V^{Rd} = \frac{100 \times C_{ir}}{\sum R} \tag{3}$$

where:  $V^{Rd}$  is risk weight,  $C_{ir}$  is overall risk assessment,  $\sum R$  is sum of the overall risk assessment.

Subsequently, the risk values were calculated as the sums of the values obtained, which were calculated by multiplying the points with the risk weights. The higher the overall rating of the country, the higher the risk of tax evasion in that country (equation 4):

$$U_{iz} = V^{Rd} \times Z_i \tag{4}$$

where:  $U_{iz}$  is value of risk with aggregated weight,  $V^{Rd}$  is risk weight,  $Z_i$  is risk.

Within the row, totals were created that were entered into the column in equation (5): Overall assessment of country risk ( $C_{iz}$ ).

$$C_{iz} = \sum U_{iz} \tag{5}$$

where:  $C_{iz}$  is overall assessment of country risk,  $U_{iz}$  is the value of risk with aggregated weight.

### 3. Results

To assess the significance of the risk factors of tax systems, the experts were asked to give individual answers. In Table 6, a risk assessment of selected tax evasion factors is presented: tax burden (R1), tax relief (R2), unemployment (R3), the complexity of the tax system (R4).

Table 6. Risk assessment

Experts		E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12
Weight ( $V^{Ed}$ )		0,5	0,5	0,5	0,4	0,3	0,4	0,5	0,2	0,2	0,2	0,4	0,5
Risk	Tax burden (R1)	7	8	8	8	7	9	7	9	8	8	8	8
	Tax relief (R2)	4	3	5	4	6	5	5	5	4	3	6	4
	Unemployment (R3)	8	4	6	6	4	8	6	4	7	5	4	5
	Complexity of the tax system (R4)	4	4	6	5	5	6	5	5	7	3	8	4

Source: Own processing

The resulting risk assessment values of 12 experts with aggregated overall risk assessment ( $C_{ir}$ ) are shown in Table 7, including the determination of risk ranking (P).

Table 7. Risk assessment with aggregated weights

Experts		E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	Overall risk assessment ( $C_{ir}$ )	Risk ranking (P)
Risk	Tax burden (R1)	4	4	4	3	2	4	4	2	2	1.6	3.2	4	<b>0.34</b>	<b>1</b>
	Tax relief (R2)	2	2	3	2	2	2	3	1	1	0.6	2.4	2	<b>0.19</b>	<b>4</b>
	Unemployment (R3)	4	2	3	2	1	3	1	1	1	1	1.6	2.5	<b>0.25</b>	<b>2</b>
	Complexity of tax system (R4)	2	2	3	2	2	2	3	1	1	0.6	3.2	2	<b>0.22</b>	<b>3</b>
$\Sigma$		-	-	-	-	-	-	-	-	-	-	-	-	<b>100</b>	<b>-</b>

Source: Own processing

The higher the overall assessment is, the higher the risk is. According to Table 7, the greatest risk that can cause potential loss by tax evasion is a large tax burden. The higher the taxes are: the more taxpayers will evade the tax. The second biggest risk is unemployment. Experts in the field of taxation believe that the higher the unemployment rate, the more that off-the-book work can occur. The risk of a large amount of tax relief and the complexity of the tax system are not, according to the expert team, such a great threat of tax evasion. A cumulative risk assessment of selected tax evasion factors for the countries surveyed is presented in Table 8.

Table 8. Assessment of selected EU countries with aggregated weights

Risk		Tax burden	Tax relief	Unemployment	Complexity of tax system	Overall assessment of countries ( $C_{iz}$ )	Country ranking
Country	Austria	1.02	0.95	1	0.44	3.41	7
	Belgium	2.72	1.33	1.5	1.54	7.09	1
	Czech Republic	0.68	0.76	0.5	1.32	3.26	8
	France	2.38	0.95	2	1.32	6.65	2
	Germany	1.7	1.14	0.5	0.44	3.75	6
	Hungary	2.38	0.38	0.75	1.76	5.27	3
	Poland	2.4	0.76	1	1.1	5.26	4
	Slovak Republic	1.02	0.38	1.75	0.66	3.81	5

Source: Own processing

All risks are maximized, *i.e.*, the higher the score, the higher the risk of tax evasion. For example, Belgium is the country with the highest tax burden and a large amount of tax relief. France has the highest unemployment rate among these countries, and Hungary is the country with the most complex tax system.

The "Country Ranking" column shows which country "drives" taxpayers to tax evasion the most, in terms of the risks involved. As a result, Belgium is the country with the greatest risk of tax evasion, then it is France. On the contrary, the countries with the lowest risk are the Czech Republic and Austria. Overall summary of the risk factors in selected EU Member States is presented in Figure 1, in order of severity.

Figure 1. Severity of risk factors in selected EU countries

Austria	Tax burden	Unemployment	Complexity of tax system	Tax relief
Belgium	Tax burden	Tax relief	Unemployment	Complexity of tax system
Czech Republic	Complexity of tax system	Tax burden	Unemployment	Tax relief
France	Tax burden	Unemployment	Tax relief	Complexity of tax system
Germany	Unemployment	Tax relief	Tax burden	Complexity of tax system
Hungary	Tax burden	Complexity of tax system	Unemployment	Tax relief
Poland	Complexity of tax system	Unemployment	Tax relief	Tax burden
Slovak Republic	Tax burden	Complexity of tax system	Unemployment	Tax relief

The highest risk
  The lowest risk

Source: Own processing

If EU Member States are trying to minimize tax evasion losses, it is necessary to pay close attention to the risks that cause these potential losses and motivate taxpayers toward tax evasion and fraud.

## Conclusion

A prerequisite for efficient tax collection is an optimal tax system that motivates people to work, entrepreneurs to invest, to create new jobs, increase dynamic and sustainable growth and, at the same time, does not give rise to tax evasion. According to the results presented in the article, the greatest risk for the state budget is the tax burden that may cause potential losses by tax evasion. From an international comparison of selected EU countries, it was found that the largest tax burden is in Belgium, while the countries with the lowest tax burden are the Czech Republic and Austria, which are among the countries with a tax quota below the EU-27 average. Countries with a high tax rate include countries with a high economic level as well as countries with a lower GDP per capita. For comparison, Putniņš and Sauka (2011) also reported, based on the results of a survey among businessmen in the Baltic States, on the reasons for tax evasion, that the 'main reason' given by the respondents was the answer 'taxes are too high'.

Determining the optimal tax is demanding because it represents a certain compromise between the fairness and solidarity of all subjects. It is also necessary to take into account the dependence of the total amount of collected taxes on the rate of taxation (Olexová and Gajdoš 2017, Radvan 2014). The Laffer curve shows the elasticity of taxable income, a concept that indirectly states that a country can maximize tax revenue by setting the tax system to the optimal point (Laffer point). Once the break point has been reached, the increase in tax rates will be negative in the form of a fall in tax revenues (the so-called forbidden, prohibitive zone). If tax rates are too high, taxpayers do not want to increase performance, or they transfer their headquarters outside of the country, which will result in a reduction in tax revenue for the state. The breakpoint's position on the theoretical Laffer curve depends on a number of factors, such as aggregate demand elasticity, aggregate supply elasticity, living standard level, tax system efficiency, the unemployment rate, and the elasticity of tax-related labour demand (Jech 2017). The perception of taxes in terms of equality (Lambert 2003) and justice, which is also reflected in the attitude towards compliance with the tax laws is also significant.

The second major factor influencing tax evasion is unemployment. In the case of high taxation of labour income and high rates of taxation, it is the effort of both individuals and entrepreneurs to reduce this burden by favouring the so-called off-the-books work.

A large amount of tax relief, taking account of the taxpayer's social and family circumstances, make the tax system of the EU Member States complicated and unclear – enabling tax evasion. In this respect, Belgium and Germany have become the most tax-evasive states in our research.



The complexity of the tax system has been identified as the smallest threat, which suggests that the experts indicate that the impact of the other tax factors examined is more significant than the administrative burden of taxation, lack of transparency, ambiguity, the behaviour of tax administrators, the frequent changes in tax legislation, etc. However, this does not mean that this factor should not be taken into account, which is also in line with the conclusions of the research presented by the authors Savić et al. (2015), according to which there is a relationship between efficient tax administration and the level of the grey economy. Moreover, according to Sudzina (2018), increased use of cryptocurrencies may "make it harder to collect taxes". Specific research is needed to examine the relation between tax law and criminal code, specifically the "effective regret" and its rules (see, e.g. Kačaljak 2015).

In further research, it is advisable to focus on examining other factors that lead to tax evasion and sub-factors of the level of the tax burden. It is appropriate to focus on tax systems with progressive tax rates that predominate over systems with the same tax rate.

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## Business Strategies of Start-Ups

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### Abstract:

Start-up is a relatively new entrepreneurial form that is characterized by very small size, incompleteness, youth and rapid development in often not clearly arranged business environments. These attributes distinguish start-up from a standard enterprise, so it can be assumed that its strategy will differ from standard typologies of business strategies. Field research has revealed four types of strategies that are typical for the research sample, namely the differentiator, combinator, stuck in the middle, smart operator. Strategies differ not only in their content but also in the impact on performance/success of a start-up. Presented research can be considered as an original contribution to deepening and expanding knowledge about action and behaviour of start-ups, thus increasing the probability of their business survival and success.

**Keywords:** start-up; business strategy; differentiator; combinatory; stuck in the middle; smart operator; success; performance

**JEL Classification:** M13; M21

### Introduction

Start-up is a very small, incomplete and imperfect enterprise in the state of origin, but rapidly developing. The condition of its survival is to find a business model that is operated by a creative and resilient team with a leader who will lead it in the right direction. Another prerequisite for the start-up's viability is a strategy which role is to find a place and way of using the business model in a competitive environment. Start-up strives to achieve its goals by way of real action, and therefore it strategizes explicitly or implicitly. Its performance is influenced by other start-ups/companies in the industry, and the strategy serves to achieve maximal performance due to internal possibilities and external constraints. It is supposed that strategies of start-ups due to their smallness and youth have characteristics that differentiate them from the standard strategies of larger and older companies, and their knowledge could increase the hope for survival and later entrepreneurial success.

### 1. Literature review of start-ups and business strategies

From the partial characteristics of start-up according to Peter Thiel, one of the founders of PayPal, it can be argued (2014, 10, 11) that start-up is a modern cultural and entrepreneurial phenomenon that is less formal than a common company, has more informal rules, and it is cemented by an extraordinary individual self-realization. Recognized business mats Steve Blank and Bob Dorf consider start-up (2012, XVII) a temporary organization to find a scalable, repeatable and profitable business model. Authors of the business model canvas (Osterwalder *et al.* 2014, XVIII) that serves to visualize the business model stated, that a start-up is making a constant effort to justify its existence, works under very limited and dramatic conditions and is expected to bring the results. The expected results are acceptance of the product in the market and attractive yield for the investor. Eric Ries, who introduced himself to the business world with the concept of lean start-up, writes (2011, 27) that start-up is a human institution designed

to create a new product or service under conditions of extreme uncertainty. Erik Ries's contribution to defining a start-up is primarily the addition of an unpredictable context that distinguishes start-up from a normal company. From this, it can be indirectly inferred that start-up is the creator of the future, creator of new needs. It shapes more business opportunities than it finds them.

Although start-up works in an environment of uncertainty and ambiguity, at the same time it tries to find concrete and usable solutions, expands dynamically and temporarily without borders, employs people who give up normal job at the expense of exciting personal growth and achievement of specific results, it may but may not work on the basis of technology and ceases to be a start-up after crossing certain boundaries (acquisitions sales, profit, number of employees and others). Start-up from a typical small and medium enterprise is distinguished ([www.podnikajte.sk](http://www.podnikajte.sk) p. 1875) with a unique and innovative product with a potential of dynamic and global growth, with a prerequisite of revenue of several tens of millions of euros. It can also be added that scalability is required from start-up, hence the ability to achieve a considerable to exponential revenue growth without greater increase of costs.

American private information agency of CB Insider has published a study (The top 20 reasons start-ups fail) on the causes of start-up failures and among the most common causes of unsuccessful business making that have roots in the strategy belong business making without any demand, smarter competition, wrong determination of costs and prices, and, finally, a malfunctioning business model. KPMG research states (2014, 34) that the start-up weaknesses that are strategic are, for example, financial planning, expansion to new markets, fundraising, critical thinking, risk perception, business intuition, and brand building.

The answers of academics and practitioners to the question what is a strategy or what is a content of strategy are usually formal and content superficial, different, and contradictory. Even the standard textbooks of strategic management do not provide sufficiently exhaustive explanations on this topic and characterize the strategy too broadly, e. g. Hill and Jones (207, 3), Hunger and Wheelen (2008, 14), Thompson, Strickland and Gamble (2007, 3, 4), Grant (2008, 12). It then causes considerable problems in the formulation of specific strategies when the strategy maker cannot rely on an explicit and adequately detailed pattern of the formal content of strategies to give him confidence that he/she is doing the right thing.

Traditional characteristics bring together the notion of strategy as a plan to achieve the goal; the plan highlights how to achieve goals as a core of strategy or a major strategic question. Goals are being achieved with the key, critical, and therefore strategic ways. Such notions on strategy, however, do not fit for its generality to its precise and concrete description. Other characteristics of the strategies are usually more specific and unambiguously reveal the content of the strategy. Karnani (2008) considers the strategy as a set of integrated decisions about the competitive environment, sources of competitive advantage, customer benefit, and organizational arrangements needed to implement the strategy. Markides (2008) perceives the strategy as a response to three linked questions: Who is the target customer? What products and services does he/she need? How to capture a target customer to buy these products and services? According to Hamel and Prahalad (1996), the essence of a good strategy is to create new markets, new products, new industries and new "white spots". D. Collis and Rukstad (1996) formulate three critical components of the strategy, which are the goal (the only exact goal that will be fundamental, for example, over five years), the area (sphere, scope, customer or goods offered, geographical location) and advantage (customer value and unique or complex combinations of activities that enable the company to provide the customer with a value). Magretta (2002) writes that the strategy has to be unique in these components: market, position, technology, product, service, customers. Hambrick and Frederickson (2001) present five parts of a good strategy: 1. Scope: Where will we work? 2. Means: How do we get there? 3. Difference: How do we win the market? 4. Procedure: What will be our speed and sequence of steps? 5. Economic logic: How do we achieve our revenue?

Throughout the set of definitions, distinctive features are visible that enable the content of the strategy to be divided into several components:

- Strategy is assumed to be an instrument and way to achieve goals. It is a grand company plan or an action plan. A key way to achieve the goals is often considered developing and consolidating a competitive advantage.
- Strategy is a set of concrete matter-of-fact parameters, namely product, needs, customer, market, resources, technology, key strategic processes, and others.
- Strategy is an attitude, the impression by which a company exerts influence on an external environment, which later changes in the real action, e.g. dynamic, rapid, original, active, passive, reactive, offensive, defensive, aggressive, cautious, tightened, opportunistic, intrusive, tracing, adaptive, pioneering, waiting, chaotic, spontaneous, The strategy is not just what a company wants to do, but also what it really does to achieve its goals.

Start-up in the period of its origin up to the phase of prototype or a minimally viable product solves, in particular, the functionality of the business model, after entering the market the second strategic theme opens, which is the business strategy. The business strategy of start-up is determined by the micro size of such a business form, the only rare asset of which is the business idea, by the absence of complementary resources, the enthusiasm and diligence of the team and the leader, considerably limited financial resources and by the time to prove the positive outcome, the external environment with great uncertainty to unambiguity, non-existent or unidentified competition. Start-up is constantly learning how to make a viable business and to strategize at the same time. The market space for its business has to be created or gained in a fight.

Although several typological concepts of business strategies have been formulated e.g. Mintzberg (1991, 70-82), Miles and Snow (1978), Hall (1980), Valverde (1999, 52), a strategic clock (Johnson and Scholes 2000, 227), it appears that the oldest and original typology by M. Porter is so universal and conceptual that it can also be applied to start-ups, and the results can then be compared with the strategies of traditional companies.

The Porter concept (1985, 12) is based on two sources of competition/competitive advantage, which are the difference and the cost. A company uses these two resources across the entire market or focuses on one or very few segments. The result is a differentiation strategy when a company operates in all or most of the market segments with distinct, extraordinary products and a low-cost strategy when a company offers a standardized product for the entire, unsegmented market or its majority. These so-called big strategies can be projected into one or a small number of market segments, and then they are a focused differentiation strategy or a focused low-cost strategy. Porter strongly recommends incline towards one of the quoted variants because otherwise there is a risk of "stuck in the middle" (Porter 1993, 39-40) when a company enterprise cannot distinguish neither product originality nor lower costs. Newer knowledge on strategy in the blue ocean concept shows that a combination of low costs and differentiation is possible. However, the occurrence of blue oceans is not a mass phenomenon. Start-up as a very small and resource-poor enterprise seems to be inclined to a specialized strategy or cooperation with other companies. However, own research findings indicate (Slávik and Hagarová 2016, 10-51) that start-ups are closed communities that do not make some partnerships and a cooperative-competitive strategy too much. Literature and research do not devote relevantly to business strategies of start-ups so far. Reasons can be other research preferences, e. g. cognition of business model, the short individual existence of start-ups, a frequent exit strategy, hence a start-up is acquired by an established enterprise, but a start-up that retains independence will not avoid strategic thinking and strategy formulation.

Internet resources offer various instructions how to make a start-up strategy, but these strategies are not actually business or competitive ones. These are the recommendations of experienced start-upers to set up and develop a business that sometimes also include a partial knowledge on business strategy (www - examples – p. 1876). Start-up research focuses in particular on how to obtain financial resources (Klačmer Čalopa *et al.* 2014), how to convince venture capitalists (Šimić Šarić 2017) to provide venture capital, how to overcome barriers of the beginning business (Petković *et al.* 2016). Undoubtedly, these are important topics, but they do not talk anything about real acting of start-ups in the business and competitive space.

The scientific literature is more about micro-enterprises, newly established and beginning conventional enterprises and business making in the virtual world, than especially about start-ups. These findings are to some extent applicable to describing and explaining the start-up strategizing. Munoz *et al.* (2015) surveyed the factors of business success on the sample of 151 micro-enterprises. Greater performance was achieved by enterprises seeking external assistance from larger companies, being active and not avoiding risk. Active action and good adaptation towards risk is characteristic for successful entrepreneurs too (Butler 2017). The research of 184 venture capital investments in the companies in the early development phase reached to some strategic consequences too. Miloud *et al.* (2012) found that enterprise performance has been positively affected the differentiation of its products, the rate of growth of the industry and partnerships with other companies.

Mata and Portugal (2002) examined the determinants of survival of newly established enterprises. Survival is affected by the benefits of ownership (financial advantages, product differentiation), by company size and growth strategies, internal organization of an enterprise and industry parameters, such as economies of scale, entering the industry and growth. Differentiation may not always have a positive impact on the business, as suggested by Hyytinen *et al.* (2015). While some authors combine the innovativeness of start-ups with positive prospects, their research points to the opposite result, which is also caused by the risky behaviour of the start-upers. Lubik and Garnsey (2016) investigated the early development of the business model in science-results-based enterprises. They argue that many of the commonly recommended strategies do not meet the needs of business practice in the early technological phase. They are created in advance without the application of a learning concept, they are limited by the complexity and uncertainty of the real environment. Lubik and Garnsey recommend new technology



companies to focus more on the high-value mass market than on niches. The considerable resources that are needed to establish, create and capture value can be very difficult to accumulate in the case of a traditional niche.

Newly established enterprises, such as start-ups, are usually weak, and therefore try to avoid direct contact. They use a judo-style business strategy (Yoffi and Cusumano 1999). Speed, flexibility and leverage effect are three basic features of this strategy. Fast moving to unoccupied market space prevents direct duel. The enterprise tests new products, pricing and distribution. Limited resources are deployed against the most vulnerable enemy sites. S. Blank (2013), describing the lean start-up, does not explicitly formulate the features of its strategy, but some of the lean method principles can be considered as manifestations of strategic action. No plan is being prepared, but the hypotheses are summarized in the business model. Hypotheses based on minimum viable product are tested at customers. Agile, iterative and incremental product development takes place.

Perhaps the closest research to standard business strategies is a study of 4,568 German start-ups (Block *et al.* 2015), which have been set up by necessity entrepreneurs. These entrepreneurs pursue a significantly more cost-leadership strategy than a differentiation strategy. The low cost strategy is more affordable for them because of poor sources.

The knowledge on start-up business strategies is highly differentiated and occasionally also contradictory, and therefore very difficult to compare. Perhaps it is legitimate to believe that new knowledge is still small and little concise, so research of business strategies should be based on traditional typologies built on low cost and differentiation, with the expectation of differences and modifications of standard business strategies due to specific attributes of start-ups.

Most start-ups must necessarily enter the international competitive environment. Local markets are too small for many products and, in particular, cyberspace does not recognize national boundaries. In the international space, more technological and financial resources are available, more room for cooperation, information gathering, and scaling. Business making on the regional market, e. g. The European Union or on the global market reduces costs and brings economies of scale. The product that requires a mass market is more advantages to launching to transnational markets without unnecessary stops on the local market (How to succeed in start-up 2017).

If start-ups want to become global players (Fetik 2013), they will have to think of their origin in international dimension, plan to enter foreign markets, speak the language of their customers, and consider an acquisition that facilitates entry to the foreign market or complements the missing asset. The global customer has an almost unlimited supply of goods and services, so start-ups must also excel in marketing, especially in building a positive public relation, a valuable trademark (branding) and effective promotion.

When a suitable form of entry to the foreign market is being chosen, the time plays a vital role because most start-ups need to expand almost immediately after the completion of product development to find out whether they evoked an interest of foreign customers and investors. Basic forms of entry to foreign markets are (Ellis and Williams 1995, 229-246) direct or indirect export, contractual entry methods intended to transfer knowledge and skills, e.g. license, franchising, alliance, technical agreement and other and investment entry methods, e.g. an independent or joint venture. The most widespread form of entry is export. The first decisions of small and medium-sized enterprises to enter the foreign market determine to a large extent their later export decisions and are more influenced by the specificities of the domestic market than the foreign market (Stouraitis and Kyritsis 2016).

In an international business environment, a company can push forward (Ellis and Williams 1995, 264, 307) multinational, global low-cost, global differentiation or global focused strategy. Given the size of the start-up, it can choose a focused strategy (something exceptional for one segment, but in the global dimension?) and then low-cost strategy (one app for the entire unsegmented world?).

## 2. Objectives and methods of research, research sample

Research is based on the hypothesis that start-ups are very small, incomplete and emerging enterprises, and therefore their business strategies are different from the typologies of standard strategies that are characteristic for the larger, more perfect and established enterprises. Related hypothesis is that there are generic strategies that perform better than other in certain situation typical for start-ups in finding users, customers or increase revenue. The goal of the research is to gain insights on the business strategy of start-ups and to arrange strategies into typological clusters that highlight and differentiate strategic action of start-ups. Another goal is to find out the impact of business strategies on start-up performance and thus to verify their purpose and effect. Start-ups that do not demonstrate higher performance for the time being prove their viability by acquiring external financial resources.

Based on the literature research (Porter 1985, 1993, Mintzberg 1991, Karnani 2008, Hambrick and Frederickson 2001), a scheme has been drawn up describing the business strategy through nineteen parameters,

which are divided into three groups: external environment (Table 2: 6 parameters), strategy description (Table 3: 7 parameters), attitude and action (Table 4: 6 parameters).

To evaluate the monitored parameters, a five-point scale is being used when one point means a basic, simple, minimal, low, local, unnoticeable level, quality or difference and five points mean top, complex, high, global, very distinct level, quality or difference. International activity is monitored from the local to the world market, and entry to the foreign market takes place in a range of indirect export, direct export, franchise network, the sale of license and sale of the start-up company.

The gauge of start-up performance/success is the number of users, the number of paying users (customers) in the scale 1 (none), 2 (several), 3 (several tens), 4 (several hundreds), 5 (several thousands and more) and revenues 1 (none), 2 (covering current costs from 0 to 25%), 3 (covering current costs from 25% to 75%), 4 (covering current costs from 75% to 100%), 5 (bringing profit to 25% of costs), 6 (bringing profit from 25% to 50% of costs), 7 (bringing profit more than 50% of costs). The measure of performance is also the extent of penetration of international business.

In the beginning, the research sample contained 76 start-ups. Each start-up was examined by one member of the research team who personally recorded responses to closed and open questions in the questionnaire in a controlled interview with the leading person. For statistical analysis (regression models and k-means clusters), the sample was narrowed in the second phase of research to 53 start-ups that meet rigorous features of start-up business making which are innovation, scalability and rapid growth in international markets. If there is a varying number of respondents, it is because some start-ups opted-out of answering several questions either because they did not know the answer or they felt the information to be confidential.

The statistical analysis of the research sample is based on descriptive and inductive statistics. The surveyed variables are expressed as average values, frequency (numerosity) and shares per the whole. Causalities are investigated on the basis of multiple linear regression that measures the impact of the business strategy on the performance/success of a start-up. ANOVA was used to test the results. The statistically significant results have a p-value of  $\leq 0.05$ . Using cluster analysis, the typology of business strategies of start-ups is identified.

The t-test method was used to compare the success/performance of strategies. Firstly, differences between success/performance factors (users, paying users/customers, revenue) in different groups of strategies were studied. Secondly, the t-test was applied to find a statistical difference between the success/performance of these groups. To identify the differences between two phases of research the paired t-test was used comparing the differences between developmental phases of each start-up.

First, we tested our variables for normal distribution using Kolmogorov-Smirnov test. The tests were negative. However, the t-test, as well as linear regression, is in general considered to be robust against non-normality as can be found in works of Snijders (2011), Bartlett (2013), Schmidt and Finan (2017), or Edgell and Noon (1984). Considering the robustness and our relatively large sample size we continued with our approach taking into account that the power of the tests can be lower.

Typical start-up of research sample (Table 1) has 2 to 12 members, exists for 2 to 5 years, tests prototype and has achieved first revenues. It is addressing in average almost 3 billion EUR market and typically has already entered international markets. According to the entrepreneurs, the business model of a start-up has almost reached its final shape.

Table 1. Sample description

Attributes	N	Mean	St.dev.	Min	Max
Age of start-up (years)	51	3,84	1,78	1	10,5
Team (number of members)	52	7,13	5,67	1	30
Business idea development	53	4,36	0,75	3	5
Total addressable market (billions EUR)	46	2,8	10,9	5	62
Market	53	3,59	1,39	1	5
Business model (nine blocks)	47	39,41	5,72	18	45
Originality of the business idea	53	3,91	1,12	2	5

Note: Business idea development (scale): 1 - idea/concept/research, 2 – product development, 3 – prototype of product/testing, 4 – first income, 5 – growing income; Market, Originality of the business idea (scale): 1 – local, 2 – national, 3 – middle European, 4 – European, 5 – the world; Business model (scale of one block): 1 – none, 2 – first notion, 3 – completed concept, 4 – trials with realization, 5 – full or almost full functionality. Source: own research

### 3. Research results

The life cycle of the industry as well of the key technology is in growth phase what means that the market and the opportunity are still getting bigger. The dynamics of the environment is rather high, but the predictability of future development is also higher. The competitive intensity is rather higher as well. The competitive position of an average start-up is in the middle of field however with higher standard deviation. In other words, the start-ups are active in a growing industry, dynamic and competitive industry with predictable future.

The life cycle of the industry and the technology life cycle are on the brink of maturing. The dynamics and complexity of the business environment are higher, but they are by no means high or extreme. The predictability of development over three to five years is roughly 50%. The intensity of competition is average, and the competitive position is also somewhere in the middle, that is, neither the strongest nor the weakest (Table 2).

Table 2. Environment description

Parameters of environment	N	Mean	St.dev.	Min	Max
Life cycle of industry	53	2,69	1,06	1	4
Life cycle of key technology	53	2,82	0,98	1	4
Environment dynamics	53	3,16	1,24	1	5
Predictability of future development	53	2,79	0,94	1	5
Competition intensity	53	2,98	1,12	1	5
Competitive position	53	3,09	1,42	1	5

Source: own research

The strategy is described by the data shown in Table 3. In general, start-ups serve several segments with their product rather different from their competitors. The costs are lower than the costs of competitors. Meanwhile, the price is considered to be the same. Start-ups try to differentiate themselves also with different key technology and with different complementary services. The target market is in general international.

Differentiation is considerably above average, but not the maximal, costs are slightly below average, while prices are very little below average. Differentiation is strengthened with a superior level of complementary services and original technology. Start-ups are on the boundary of central European and European markets.

Table 3. Strategy description

Segmentation	53	2,94	0,88	1	5
Differentiation	53	3,96	0,85	2	5
Costs	53	3,42	1,02	1	5
Price	52	2,85	0,91	1	5
Complementary Services	53	3,81	0,78	1	5
Key Technology Originality	53	3,71	0,93	1	5
Target market	53	3,57	1,34	1	5

Source: own research

More than 40 % of start-ups (22/53) are in the global marketplace that means their sales take place outside the European business area, e.g. USA, Canada, South America (Brazil). Start-ups are also active in the Russian, Chinese and Australian markets. One-third of start-ups is focused on European markets. The most common European foreign markets which start-ups are located in are the Czech Republic, Austria, Germany, Spain, the United Kingdom and France. Rest of start-ups operate at national or local level (only Slovak market or part of Slovak market).

Considering entry mode is one of the strategic issues to decide. Start-ups choose the export as the main form of entry into foreign markets (direct export 67.35%, indirect export 16.33%). The next popular entry mode is franchising, about one tenth of the start-ups are considering using this form. Licensing is also recommended as an effective entry mode for applications and technological products. However, just under 2% of the start-ups use this entry mode.

Start-ups based on e-applications and e-commerce are usually instantly seeking to enter the international market because the domestic market is small for them from the very beginning of the business making. Even their headquarters are established abroad. International expansion is determined seeming chances, e.g. participation in a foreign exhibition and the interest of a foreign investor or customer, sometimes the domestic investor meets a foreign partner who will bring not only know-how but also access to the foreign market. Most products and services are designed without significant local or national attributes, hence globally, and therefore the internationalization of business is conditioned by the entry into high-capacity foreign distribution channels.



A paired t-test had been conducted to analyze whether there was a difference between two phases of research separated by eight months and to identify the change. It had been found that there was a significant change in case of segmentation (first round,  $M=2,59$ ,  $SD=1,12$ ; second round,  $M=2,94$ ,  $SD=,88$ ) conditions  $t(50)=-2,48$ ,  $p=0,017$ ; Costs (first round,  $M=3,08$ ,  $SD=1,00$ ; second round,  $M=3,37$ ,  $SD=1,02$ ) conditions  $t(50)=-3,00$ ,  $p=0,004$ ; and complementary services (first round,  $M=3,20$ ,  $SD=1,39$ ; second round,  $M=3,75$ ,  $SD=1,04$ ) conditions  $t(50)=-2,71$ ,  $p=0,009$ . Between the rounds, the start-ups shifted from more wide to narrower segmentation with better focus probably finding out their real customer. They were also able to lower their costs, becoming significantly more efficient. Finally, the focus on the quality of complementary services also grew what could be a result of differentiation tool as these companies declared their rather strong differentiation strategy.

Next, the strategy is described as attitude and action towards the competitors in Table 4. Most of the start-ups in research sample declared offensive strategical attitude. This attitude is strongly influenced by the character of a start-up that is a new company which does not have a real market share yet and has to be offensive about it and tries to expand its market share. However, they are not strong enough to use more aggressive approach. Two major distinct attitudes toward the initiative could be identified. Start-ups either pioneered the field of business or were close behind and tried to adapt to the recent changes. Most of the studied start-ups declared a thought-out approach, they had a plan, and they tried to follow thru it.

Most start-ups are hard-working in their actions, active, initiative and thoughtful attitudes prevail. The action is fast and dynamic, the start-ups perceive their environment smartly and strive to act/strategize in a considerably different way than their competitors. In addition to a thoughtful action, a significant share of start-ups is acting opportunistically.

Table 4. Strategy as attitude and action

Attitudes	Strategic attitude				
	timid	careful	defensive	offensive	aggressive
Competitive					
Number of start-ups	2	8	5	29	9
Percentage	3,77	15,09	9,43	<b>54,72</b>	16,98
Initiative	passive	reactive	waiting	adapting	pioneering
Number of start-ups	2	3	5	21	22
Percentage	3,77	5,66	9,43	<b>39,62</b>	<b>41,51</b>
Thought-out	chaotic	spontaneous	opportunistic	forced	systematic
Number of start-ups	1	4	16	0	32
Percentage	1,89	7,55	<b>30,19</b>	0	<b>60,38</b>
Speed of actions	low	moderate	rather high	high	very high
Number of start-ups	0	10	11	21	11
Percentage	0	18,87	20,75	<b>39,62</b>	20,75
Sensitivity	low	moderate	rather high	high	very high
Number of start-ups	2	2	15	21	13
Percentage	3,77	3,77	28,30	<b>39,62</b>	32,08
Different strategy action	same	small	rather high	high	total
Number of start-ups	0	9	22	17	5
Percentage	0	16,98	<b>41,51</b>	32,08	9,43

Source: own research

The speed of actions of studied start-ups is rather high as they are small companies on growing market. The sensitivity to environmental changes is also high what is due to novelty character of the business and is reinforced by the speed of actions possibility. The difference of actions of studied start-ups is rather high. It can also be seen in Table 4 that a start-up wants to gain the first mover advantage in the field of their business by the use of the initiative approach.

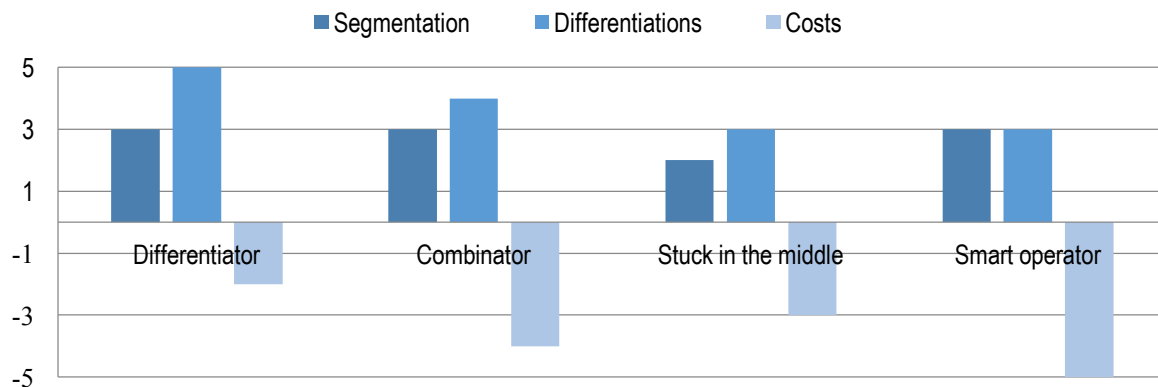
To asset and describe the strategies of start-ups, the K-mean Cluster method was used to find groups of a similar strategy. The Michael Porter typology was used as a background for classifying of strategies. As shown in Graph 1, four kinds of different strategies of start-ups had been identified.

The strategy of the differentiator is used by 22.64% (12/53) start-ups. They have more market segments with higher costs than competitors and are trying to differentiate from the competitors strongly. This kind of strategy is a typical, distinctive differentiator according to Porter's typology (several segments, max. difference, enough high costs). Examples:

- Start-up BeeSafe provides a sense of security for the user who can call in help in case of emergency. It is a personal safety application on the GPS principle for iOS and Android devices. Their differentiation stems from a

universal platform that is integrating a broad range of safety problem solutions and can be modified and used in different businesses. Their costs are strongly driven by the wages. They target several broader segments in individual, business and non-profit area.

Graph 1. K-Means cluster analysis of strategies



- Start-up *KickResume* provides a simple and user-friendly web application that helps to create a good looking CV, cover letter, or personal site quickly. They differentiate themselves by the simplicity of the product and continual product development and innovation. Their costs are a little higher than the cost of their competitors, as they are hiring a lot of people with respect to their size. They are targeting several distinct segments; however, the product can be universally used.

- Start-up *Vectary* provides a cloud 3D modeling tool for people who are not experienced in modeling complex shapes. The user gets a tool to create their own models. The only limitation is his/her own imagination. Start-up serves several segments in the global space. They are makers community which is dedicated to 3D modeling for hobbies and their own needs, a community of creators which is dedicated to 3D modeling as a potential source of earnings, colleges to learn 3D modeling of any object, partner companies that expand 3D modeling options, e. g. realizing virtual 3D design using 3D printing, exporting 3D objects to computer games. Differentiation is on a global level because developers from other software companies have confirmed on various events of European and world importance that there is no or better 3D modeling tool in the browser environment as *Vectary* offers. Competitors are oriented to professional users and customers, *Vectary* focuses mainly on do-it-yourselfers. There are no direct competitors; there are only three similar applications in the browser. Segment-oriented marketing, expensive top specialist developers, demanding entry into the US market, shifting the focus of work to infrastructure, building sales, and continually improving processes are causing higher costs.

The *combinator* is a typical strategy if a start-up has fewer segments in comparison of a strong differentiator and is making less difference probably as consequence of lower costs. It is used by the most start-ups in the sample 45.28% (24/53). This kind of strategy is a typical, weaker, less distinctive differentiator according to Porter's typology (not so much segments, higher, but not max. difference, lower costs, but not absolutely low). Examples:

- Start-up *Sli.do* provides audience feedback at conferences. It is one of the first Slovak start-ups to be established on foreign markets (Great Britain, USA, and Asia). Their point is to cultivate the discussion by crowdsourcing the best questions from the audience. Start-up sells the product as a one-off or annual service package for event organizers to receive an application and platform for immediate use. In 2016, the application was used on 21-thousand events in more than 100 countries. Its users include companies like Netflix, Airbnb, Lufthansa or Dell. This start-up has significant fixed costs, made up of operational and personnel costs, however, variable costs do not change with volume, what makes their product scalable as their unit costs strongly decrease with volume sold.

- Similarly, start-up *Staffino* also provides feedback, but about the quality of service and staff. It is an independent evaluation system that provides the managers with an overview of customer satisfaction. It provides spontaneous stuff or product evaluation via the web and mobile application or on-demand email evaluation. This communication tool is used wherever the customer comes into contact with the staff. Start-up expands its network around the world and is gradually opening new branches.

The *stuck in the middle* is a mediocre player with smaller segmentation, average difference, and average costs. This strategy is used by 15.09% start-ups of research sample (8/53). This kind of strategy is typical for a multilateral, but finally, average company according to Porter's typology (everything is average) which wants to become apparent in everything and after all is not the best in anything. Examples:

- Start-up *Speekle* offers gaming logopedics software that complements the speech therapist and parent when it helps kids to eliminate speech defects. It helps to overcome the little interest of children and parents regularly practice a speech exercise. It is currently operating in one common segment of speech therapists and parents. However, sales will be bigger if the software is promoted and sold through speech therapists who get it free of charge to motivate parents to buy it. Differentiation is at the Central European level, as there is no direct competition on the regional market. Logopedics exercises are based on two technologies; children can control games by tongue or articulation of sound and include three applications. Product costs are lower, but not the lowest. The product is affordable (33 euros/application) but at the expense of a small selection of gaming aids. Keeping low prices and costs is only possible with minimal or no marketing.

- Start-up *Decent* is using blockchain technology to offer a content distribution platform. With this platform, they are providing cost-effective distribution, allowing to avoid any 3rd party publishing fees, gaining freedom from syndicated channels, and keeping control over their own content. Start-up is at the stage of product development and testing. By continual analysis, the start-up tries to find out to what extent the product can work at a minimum cost level. The plan is to act globally. They segment their customers primarily into the Asian market and other countries.

The *smart operator* is similar to a smart maker who is capable of offering a more differentiated product at very low cost (maybe low price) but for the limited audience only, e.g. if a start-up targets a small number of segments only. This strategy is pursued by 16.98% of research sample (9/53). This kind of strategy resembles the best cost strategy which is the complement of Porter's typology (several segments, difference slightly over average, very low cost (Thompson *et al.* 2007, 134) or is close to garden-of-Eden strategy from Hall (1980). Examples:

- Start-up *Octago* produces external training constructions made of steel pipes, which are joined by an octagonal catch. Smaller and bigger playgrounds are built of the individual training instruments; a single exercise tool can be supplied for a family home too. Start-up captured the popular weight-training exercise trend. It serves several segments, such as towns, developers, hotels, sports resorts/camps. Free of charge outdoor training improves the image of towns and developers. Differentiation is at the Central European level; there are only two similar companies in Slovakia and one in the Czech Republic. Exercise tools are based on an exceptional construction element, which is an octagonal rim (octago). However, the production and building of the structure is easy to imitate. Start-up, besides the delivery of training playground, also offers sport-exercise tours, stays, training. Promotion on blogs, portals, and sports races is no longer sufficient for further growth. The production and assembly costs are very low, because simple steel parts are produced in series and bulk, and are easily attached with the fitting. The training structure is highly variable and complicated and in the process is assembled from a few types of parts only.

- Start-up *Zelená pošta* (Green Post) offers revolutionary solutions for postal services. The originality of the business idea lies in a combination of innovative postal and electronic delivery service. The start-up concept is cost and time-saving, what is a motivating factor for customers, so they do not have to stand in long lines at the post offices. The start-up provides printing, inserting sheets into envelopes, and posting them on the post office. They cooperate with large print companies, that, besides printing, also provide enveloping and delivering at lower rates than when the business or individuals are doing it by themselves.

After dividing the start-ups according to their strategies into four groups, the strategies are analyzed according to their performance consequences. Most of the studied start-ups (Table 5) have several thousands (modus = 5) of users while having several tens of customers (modus = 3). Most of the start-ups cannot cover their costs from revenues (modus = 2), they cover contemporary costs from 0 to 25 %. However, 17 start-ups (32.08 %) are profitable. Bulk of start-ups are already operating in the global market.

Table 5. Indicators of performance/success

Performance	N	Mean	St.dev.	Med	Mod	Min	Max
Number of users	53	3,87	1,14	5	5	1	5
Number of customers	53	3,21	1,31	3	3	1	5
Revenues	53	3,40	1,66	3	2	1	7
International reach	53	3,58	1,40	4	5	1	5

Source: own research

Start-ups stake their own money, the money of investors and some of them are able to earn new money (Table 6). 42.31% (22/52) of start-ups do not have external investors financing their operations. On the other hand, 21.15% (11/52) can finance all their operations from generated revenue. More than 55.77% (29/52) of start-ups are

fully financed by their investors or by their own generated revenues, while 13.46% (7/52) do not have either external investors, neither generated revenues and are only financed by their own resources, their friend, and family.

Table 6. The ability to attract and generate finance

Resources of finance	N	Mean (%)	St. dev.	Med	Mod	Min	Max
Own resources: savings	52	20,38	33,47	0	0	0	100
Other person's resources: investors	52	39,81	39,89	50	0	0	100
Own resources: retained profit	52	33,46	41,53	8	0	0	100
Other	52	6,35	17,18	0	0	0	90

Source: own research

In Tables 7, 8, and 9 we present the results of a pairwise test that we conducted to find out whether there were differences between the impact of different strategies on users, customers, or revenues. The strategies with higher mean are written in the table for all pairs. If the difference was statistically significant, it was marked depending on the level of significance.

Table 7 quotes successfulness of the different strategies in acquiring the users. Analysis by the t-test surveys whether a significant difference is in acquiring customers among the various strategies. The most successful strategy is stuck in the middle followed by the differentiator. Nor combinator nor smart operator had a significant success compared to other strategies.

Table 7. Impact of strategies on users

Strategy	Differentiator	Combinator	Stuck in the middle	smart operator
Differentiator	--	<i>Differentiator*</i>	<i>Stuck in the middle*</i>	Differentiator
Combinator	<i>Differentiator*</i>	--	<i>Stuck in the middle**</i>	Smart operator
Stuck in the middle	<i>Stuck in the middle*</i>	<i>Stuck in the middle**</i>	--	Stuck in the middle
Smart operator	Differentiator	Smart operator	Stuck in the middle	--

Note: Significance level of t-test \*\*0.01 \*0.05 +0.1. Source: own research

The relation between strategy and customers (paying user) is presented in Table 8. The most influential strategy is the differentiator, followed by a strategy of combinator.

Table 8. Impact of strategies on customers/paying users

Strategy	Differentiator	Combinator	Stuck in the middle	Smart operator
Differentiator	--	<i>Differentiator*</i>	Differentiator	Differentiator
Combinator	<i>Differentiator*</i>	--	Stuck in the middle	<i>Combinator*</i>
Stuck in the middle	Differentiator	Stuck in the middle	--	Stuck in the middle
Smart operator	Differentiator	<i>Combinator*</i>	Stuck in the middle	--

Note: Significance level of t-test \*\*0.01 \*0.05 +0.1. Source: own research

The impact of different strategies on revenue is shown in Table 9. Using the same approach as before, the differentiator strategy is identified as the best in creating revenues, followed by stuck in the middle.

Table 9. Impact of strategies on revenues

Strategy	Differentiator	Combinator	Stuck in the middle	Smart operator
Differentiator	--	<i>Differentiator**</i>	Differentiator	Differentiator
Combinator	<i>Differentiator**</i>	--	<i>Stuck in the middle*</i>	Smart operator
Stuck in the middle	Differentiator	<i>Stuck in the middle*</i>	--	Stuck in the middle
Smart operator	Differentiator	Smart operator	Stuck in the middle	--

Note: Significance level of t-test \*\*0.01 \*0.05 +0.1. Source: own research

Evaluation of the relationship between strategy and performance/success of start-up using the Porters typology of business strategies is stated in Table 10. The number of users, the number of customers (paying users), the revenues and the international reach are used to evaluate the early performance. Each of these indicators represents an important progress in start-up's early achievement. In the beginning, a start-up needs users to develop the product, later it needs the proof of concept and revenue, and after that it needs to begin to be autonomous and self-sufficient. The result of regression analysis is that no significant effect of strategy on users, customers, and revenues were found. The explanation can be, that there is not the best strategy for a start-up and there are many ways how to achieve success. However, a significant effect of differentiation on international reach was identified. The start-ups that tried to differentiate themselves from competitors were better in reaching

international markets. The probable explanation is that as a bigger market has more competition, it seems more beneficial for a new company to compete on differentiation than on costs because the processes for cost-lowering are still not in place.

Table 10. Regression analysis of the relationship between strategy and performance/success

Variable	Users	Customers	Revenues	International reach
Segmentation	-0,29 (0,18)	-0,08 (0,20)	0,01 (0,26)	-0,16 (0,21)
Differentiations	-0,14 (0,19)	-0,14 (0,21)	0,05 (0,27)	0,61** (0,22)
Costs	-0,10 (0,16)	-0,33+ (0,18)	-0,37 (0,23)	0,15 (0,19)
R <sup>2</sup> adjusted	0,01	0,02	0,00	0,09
F (3,49)	1,25	1,32	0,96	2,76
N	52	52	52	52
Standard Error in parenthesis, Significance level **0,01 *0,05 +0,1				

Source: own research

#### 4. Discussion

*The research sample.* Studied start-ups are very young and small enterprises with business ideas and business models at a high stage of elaboration. They are located on the frontiers of large markets and business opportunities that are attractive and predominantly abroad. Start-ups, which usually have only one scarce asset, which is a business idea, however, do not have to handle future tasks. They stand before the challenge how to change themselves into a relatively complete enterprise or become an acquisition of a larger and older enterprise.

*Environment.* The industries which the start-ups are located in grow, but their growth will slow down, as well as the improvement of technology, and therefore the foreseeability should be enhanced, but at the expense of diminishing opportunities. The intensity of competition and competitive position are average, but with the growth of competition, it will be harder to maintain a position. The average perception of the environment and the average position therein may also be a sign of inadequate knowledge of the environment, or inadequate crystallized attitude/position therein and towards it, or the environment is really average, but then it will not bring or will not have the potential of unexpected and attractive challenges and completely new needs. However, the nature of the start-ups is assumed that they should be located in an environment that is just beginning to develop and therefore the values of the parameters should be low in the range of one to two points. Otherwise, start-ups are losing a moment of surprise, the advantage of the first enterprise, some components of competitive advantage and so on.

*Strategy content.* Start-ups are usually expected to be exceptional and original. The start-ups have a slightly up to the more average strategy, but not an excellent strategy; they are likely limited by their competition or a strategic thinking capacity in this case. This also corresponds to the operating space, which is for the time being regional on average and not global. Reasons are internal incompetence of start-ups, weaker business ideas, or weaker competitiveness, hence again less effective strategy or its weaker implementation.

*Strategic action and attitudes of start-ups* reflect their youth and inexperience, but also enthusiasm and self-confidence. Small teams are deciding quickly, less complicatedly, they are getting easier a consensus in comparison to larger companies. They are mostly not burdened with negative experiences, and at the same time they cannot imagine all the pitfalls of future development, and therefore probably risk more. Lack of analytical knowledge or its objective absence is replaced by opportunistic action (hands-on approach).

*Types of strategies (clusters).* The identified types of strategies are distinguishing least in segmentation. Differentiation is always at least medium, higher up to high. With the exception of the "stuck in the middle" type, 83% of the start-ups (44/53) are trying to differentiate more or less. Start-ups are trying to occupy more or at least several segments, although an unsegmented market with one standard product or one segment with a special product would be expected. The greatest differences between strategies are in costs ranging from above average up to a minimum. Research conducted on a sample of 330 standard enterprises found (Slávik 2010) that up to 80% of enterprises are implementing a differentiation strategy and 20% are upholding a typical low-cost strategy. Most companies (50%) operate on one or a small number of segments, a smaller group of companies (37%) targeting a larger number of segments and a minority of companies (13%) operating on an unsegmented market. Distribution of differential and low-cost strategy does not bring any significant differences between standard companies and start-ups. An exception is the *stuck in the middle* strategy that occupies multiple segments. Other strategies are active on a small number of segments. Here is a more obvious difference in comparison of segmentation of traditional companies.



The latest research of start-up strategies has reached probably to one of the first typologies, but authors of Gans *et al.* (2018) call them go-to-market strategies that identify strategic opportunities for a new business. They put forward four strategies that are based on two dimensions: the attitude towards the incumbents (collaborate or compete?) and the attitude towards innovation (build a moat or storm a hill?). A direct comparison of this typology with the results of the research conducted with regard to the different dimensions of the strategies is very questionable. Rather, they are jointly expanding and deepening the cognition of start-up business strategies.

*Performance/success.* Performance measured by traditional indicators, in particular, revenue and profit, may not accurately verify a success of start-ups because they are young and their development is incomplete. The growth trend and the conversion rate of users to customers and customers to revenue are crucial. Strategies to achieve their goals go through some kind of conversion. "Stuck in the middle" gains most users and then is followed with the differentiator. When getting customers, the differentiator is the most successful, and then the combinator is the second most successful. Most revenues come with a differentiator and then "stuck in the middle" earns the most. It seems that the most effective is a differentiator in the course of conversion from users to revenues. The extreme difference is obviously a key condition for success. The position of the "stuck in the middle" is unexpected, which is inconsistent with the notions about of start-up features, its product, and strategy. It is not excluded that this type of strategy is transitional, it will change, and its current content has some more unidentified attractiveness for which customers are willing to pay.

The strategy probably does not play for a start-up such a role in performance achievement as it is for larger and older companies if the strategy is expressed according to Porter's typology, which has quite clear criteria. Start-ups do not seem to have well-defined strategies in this sense. Explanation of the insignificant impact of Porter's strategies may also lie in the "stuck in the middle" strategy and its impact on performance/success. Its, albeit a small, share may reduce the effectiveness of the unambiguous strategies, which is then reflected in poor statistical significance.

*The international dimension of the strategy.* Access to international markets is essential for most start-ups. Their lack of experience in the business world is, however, a significant obstacle to searching for and linking foreign contacts. An important factor in the implementation of the international strategy is the originality of the business idea of the start-up. The research results confirmed the fact that global start-ups have highly original business ideas. To run a business on the international market is also a key factor for start-ups because it enables them to scale up the product relatively quickly and keep building a global brand from the very beginning.

## Conclusion

The theme of the strategy in a start-up is getting at the forefront when the business model, team building, and market entry are resolved. The start-up strategy is firstly about a notion of markets, segments, differentiation, costs, prices, complementary services, a technology that is embedded in the business environment, and then this idea is realized through attitudes and actions.

The real start-up strategy is the action by which it achieves its goals while being limited by the nature of the environment and competitors. Research has identified four types of start-up strategies/actions that have a different effect on the achievement of targets expressed by a number of users, customers, and revenues. Start-ups as small and incomplete companies are strategizing hence, though to a certain extent with another way than larger and older companies. The differentiator, combinator, stuck in the middle and smart operator strategies are more effective in achieving goals than strategies according to the traditional Porter typology, although they are recorded using formally identical criteria.

The set of standardized strategies describes and generalizes action of start-ups, it is an original contribution to deepening and expanding knowledge on start-ups and provides relatively clear limits of the action and behaviour of start-ups in a competitive environment, including the outcome of such an action.

Identified strategies are used start-ups, most of which are at a high stage of development, which signals a nearly resolved business model. They characterize their actions and, of course, strategic thinking, but it will be necessary to follow their further development and examine their stability or changes. Confrontation with strong rivals and demanding customers can modify contemporary strategies.

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## Global Supply Chain Imperatives

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### Abstract:

Competitive development trends in modern economic paradigm are associated with a switch from competition of economic entities (enterprises, firms) to competition of supply chains. These trends are associated with scaling up and increase in the number of supply chain links, which is dictated by the interest to gain sustainable competitive advantages in commodity markets. The research problems have been solved using general scientific and special methods to research global supply chains, namely: system analysis and typological grouping methods to substantiate the specific composition of international supply chains; methods of structural-functional analysis when designing options for configuring global supply chains with participation of customs clearance agents; model representation methods for cooperative forms of global supply chain participants and coordination of logistical processes with elements of economic analysis of customs operation costs– in justifying competitive logistics solutions. Development of conceptual ideas and methodological approaches to global supply chain management has made it possible to justify expediency of their configuration taking into account the rules of customs administration of logistical processes.

The article develops scientific understanding of a global supply chain as an integrated logistic category based on studying internationalization and globalization processes; fundamental provisions of the supply chain management concept have been detailed in the light of globalization. Along with the fundamental provisions, a set of innovative solutions to improve the efficiency of customs administration has been substantiated as part of regulatory, infrastructural, information technology measures generally aimed at improving the customs infrastructure and optimizing logistical processes with elements of managing customs and logistical risks of time and financial losses related to declaration, handling and bonded storage of goods. It is recommended to use the research findings by global companies, commercial brokers and associated businesses established with their involvement, operating in the external economic and customs areas, as well as public administration and logistical process customs regulation bodies.

**Keywords:** global; logistics; processes; global supply chain; interstate logistic space; cross-border supply chain; customs

**JEL Classification:** R41; F15; F16

### Introduction

Currently, the most effective way to organize cooperation and build counterparty relationship is the concept of *Supply Chain Management (SCM)*. According to AMR Research and Forrester Research, when introducing SCM, companies get such competitive edges as reducing costs and curtailing the order processing time (by 20-40%), reducing procurement costs (by 5-15%), curtailing time of market access (by 15-30%), reduction of stocks on the ground (by 20-40%), a decrease in production costs (by 5-15%), an increase in profits by 5-15%.

Introduction of the Supply Chain Management concept in scientific and practical terms was conditioned by appearance of the idea to coordinate commodity flows of technologically related enterprises cooperating on specialization basis in the 1980s (Oliver and Webber 1992, Golovina and Golovin 2013). It is important to note that it is referred to both subject and functional specialization that lays the groundwork for stable cooperative networking. This practice required appropriate scientific support and thereby affected natural evolutionary processes of applicative scholarly knowledge development (Silkina and Shevchenko 2014, 167).

Economic management priorities require that the maximum benefit is derived from Russia's integration with partner countries; therefore, the emphasis in stakeholder interaction management should be placed on globalization of supply chains. Supply chains should be built in such a way that, on the one hand, the scale of logistical processes generated by interaction of supply chain participants is maintained, while on the other hand, the costs associated with crossing customs borders, declaration of goods and customs payments are reduced (Tyapukhin 2015). Thus, it is referred to ensuring and availing of the opportunity to combine the economic scale effect of global supply chains with the effect of cutting transaction costs, focusing on the cost level of domestic supply chains that are built up within one state and thereby creating competitive advantages in trade economic integration. This dual goal can and

should be tackled with a counter-directed effect of measures aimed at customs regulation and management of global supply chains.

*Purpose of the article.* Imperatives formulated as a whole and presented in the global logistics theory should gain traction in development of a global supply chains management methodology – this benchmark has determined the formulation of research objectives:

- to substantiate the structural-functional construction and configuration features of global supply chains, taking into account the transboundariness factor;
- to investigate the nature of customs administration impact on the organization of logistical processes in international merchandise distribution;
- to propose methods to justify options for developing competitive advantages of global supply chains;
- to achieve the potential of information and technological support for customs administration procedures of logistical processes in the globalization context.

In the course of global supply chain management, commodities transported through customs borders pass through a mandatory customs declaration procedure. At the same time, customs payments are collected as a measure regulating export-import commodity flows and are aimed at economic defense of domestic producers.

Increased international competition necessitates a reduction of costs associated with goods crossing customs borders. Reaching interstate agreements, first of all, the Customs Union of Russia, Belarus, Kazakhstan with subsequent accession of Kyrgyzstan and Armenia thereto (CU) has led to abolition of the inner-union customs borders of member states, which has encouraged of global supply chain formation since the absence of customs borders means free movement of goods in the CU territory. When commodity flows cross the inner borders of the Customs Union, the need for such customs operations as customs declaration of goods, payment of customs duties and fees is eliminated. This greatly accelerates the logistical process of stock movement and reduces its cost, taking into account the transboundariness factor effect.

International economic integration as an objective process conditioned by intensified differentiation of labor in the international economic scale and supported by interstate trade and economic agreements generates new forms of economic entities' interaction expressed, among other things, by global supply chain building. The complexity of this process is significantly increased due to the growing market share of international, multinational, transnational and other companies whose activities involve supply chain building across state and/or customs borders. Global companies hold a distinguished position among market participants, having become a sign of globalization in a number of industries, including automotive, electronic, high technologies and electrical household appliances, etc.

Unfortunately, Russia does not have a large representation among global companies. Nevertheless, Russian businesses turn out to be involved in global trends by participation in global supply chains of foreign producers (Table 1).

Table 1. Top 10 exporters and importers of automotive products, 2015 (Billion dollars and percentage)

Exporters	Value	Share in world exports/imports				Annual percentage change			
	2015	1980	1990	2000	2015	2010-15	2013	2014	2015
European Union (28)	653	-	-	- 49.8	49.3	4	6	6	-6
extra-EU (28) exports	229	-	-	12.2	17.3	5	6	1	-10
Japan	137	19.8	20.8	15.3	10.3	-2	-8	-4	-6
United States	129	11.9	10.2	11.7	9.8	5	2	2	-6
Mexico a	97	0.3	1.4	5.3	7.3	12	11	11	5
Korea, Republic of	71	0.1	0.7	2.6	5.4	5	3	1	-6
Canada	62	6.9	8.9	10.5	4.7	4	-4	2	1
China a	49	0.0	0.1	0.3	3.7	12	7	11	-3
Thailand	27	0.0	0.0	0.4	2.0	7	7	1	2
Turkey	17	0.0	0.0	0.3	1.3	4	13	4	-3
India	11	...	0.1	0.1	0.9	8	2	16	-4
<b>Above 10</b>	<b>1253</b>	-	-	<b>96.3</b>	<b>94.6</b>	-	-	-	-
<b>Importers</b>									
European Union (28)	498	-	-	42.5	36.7	3	6	8	-2
extra-EU (28) imports	72	-	-	5.6	5.3	4	1	3	8
United States	292	20.3	24.7	29.4	21.6	9	4	6	7
China a	73	0.6	0.6	0.7	5.4	7	5	20	-22
Canada b	68	8.7	7.7	8.0	5.0	3	0	-2	-4

Exporters	Value	Share in world exports/imports				Annual percentage change			
	2015	1980	1990	2000	2015	2010-15	2013	2014	2015
Mexico a, b	45	1.8	0.3	3.5	3.3	9	2	7	4
Saudi Arabia, Kingdom c	33	2.7	0.9	0.7	2.4	16	3	0	42
Australia b	24	1.3	1.2	1.5	1.7	1	-10	-10	-4
Turkey	20	...	0.4	1.0	1.4	5	16	-6	9
Japan	19	0.5	2.3	1.7	1.4	6	0	4	-9
<b>Russian Federation b</b>	<b>16</b>	-	-	<b>0.2</b>	<b>1.2</b>	<b>-7</b>	<b>-8</b>	<b>-21</b>	<b>-51</b>
<b>Above 10</b>	<b>1088</b>	-	-	<b>89.0</b>	<b>80.2</b>	-	-	-	-
a Includes significant shipments through processing zones									
b Imports are valued f.o.b.									
c Includes Secretariat estimates									

Source: World Trade Organization 2016.

One of the opportunities used by them correlates with foreign market development by transnational concern *Nissan Motor Co*. Having made the way from a national (incorporated in 1933, Japan) to a global company, today it has car manufacturing plants in 16 countries, while official sales are conducted in 190 countries.

Promotion of Nissan cars to the Russian market (1993) began with Moscow dealers working on a direct contact basis with foreign trading houses authorized to sell in the Russian Federation. The dealer duties included: implementation of a logistic scheme, customs clearance, sales planning, maintenance of a warehouse for spares, advertising, etc., and, ultimately, a competitive price support. *Nissan Motor Co* directly entered the Russian market by opening trading company *Nissan Motor Rusin* 2004. Formed as a subsidiary of *Nissan Europe S.A.S*, the company imported finished vehicles and spare parts, conducted all necessary operations related to the sales, including logistics, customs clearance and warehouse maintenance, as well as wholesaling sales to dealers, defined marketing policies and provided technical support for after-sales service. Car dealership was carried out through a dealer network in 30 cities of Russia. Its presence was further expanded in the line of production development (*Nissan Manufacturing Rus*, 2009, St. Petersburg, *AvtoVAZ*, 2014, Togliatti). Today, *Nissan Motor Co* builds its success upon strong positioning principles and strategies that are expressed in a global mission: to provide unique and innovative automotive products that deliver superior measurable values to buyers, employees, dealers, and suppliers.

Resorting to such practice and studying the development forms of interaction between global companies and partners in the world market make it possible to acknowledge that the emerging realities pose challenges for economics to develop conceptual foundations of logistics and supply chain management, including to adapt the basic concept of supply chain management to the globalization context, which requires initial substantiation of global supply chain imperatives.

An imperative (in Latin, *imperativesis* commanding, regulating; from Latin *impero*– I command) is a demand, an order, a law. The term used in the context of a supply chain means a rule, an instruction that serves to implement essential characteristics of a supply chain as a set of economic entities (suppliers, producers, consumers, and intermediaries) united by participation in a single replenishment cycle of goods (services). Proceeding from the supply chain concept definition with a variety of options developed in the logistics theory, basic supply chain imperatives are correlated with the principles of the logistics theory: (1) economic relation that is an institutional basis for a supply chain formation; (2) the link structure and the number of echelons in a chain; (3) chain scalability (direct, extended, maximum); (4) logistical processes that are the economic basis for a chain functioning for value and added value engineering when executing the rules of logistics; (5) a combination of economic, administrative, and legal methods for serving the interests of chain participants; (6) a spatiotemporal form of economic entities' interaction and of ensuring network development of supply chains; (7) the presence of a management focal company exercising functions of coordinated management of logistical processes.

Basic imperatives are invariant in their applicability to all supply chains, including global ones, without exception. With respect to the basic, that is, general imperatives, specific, private, imperatives of global supply chains should establish rules for meeting the requirements of interstate agreements, compliance with government regulations and corporate standards of global companies, including those relevant for global supply chains of customs administration standards.

## 1. Literature Review

World economic entities are naturally involved in the system of international trade and economic relations (Shapovalova 2016) based on promotion of relationship between entities linked by a single manufacturing chain.

As a system of business relations between suppliers of material resources, processing enterprises and end-consumers, the manufacturing chain phenomenon arose simultaneously with commodity production development. It has grown into a managed system using integration mechanisms and building integrated manufacturing chains, each of which is a network of businesses and organizations participating in development, production, sales, and, if necessary, take-back of finished products, systematically organized by long-term contract execution (Bliakhman and Petrov 2003).

Characteristics of modern integrated manufacturing chains determine:

- sustainable co-operation due to finished product sophistication, an increase in its research intensity, an innovation cycle time;
- a combination of intersectoral and interfunctional cooperation principles typified by participation of not only production-oriented but also marketing, research-engineering, sales, service, financial and other organizations in manufacturing process;
- consolidation of consistent cooperation principles by agreeing the terms and conditions of supply, including logistics, prior to production;
- global scale of cooperation related to national market integration;
- introduction of coordination and network management (Bliakhman and Zyabrikov 2015).

Objective in its core, the process of forming integrated manufacturing chains in the current context acquires a number of new managerial nuances:

- products are developed and launched into manufacture in accordance with marketing logistics requirements and its main principle of customer-oriented business (Shcherbakov and Dandina 2014);
- the conditions of logistics, along with the conditions of production, are determined by development of counteragent relations;
- as part of an integrated logistical flow, an increasing share is accounted for by services and research and development deliverables;
- pricing takes into account the costs per unit of consumer's effect (value), rather than per unit of output;
- in the structure of production costs, the share of associated (arising in related activities) and advanced (R&D, personnel training) transaction costs increases;
- virtual companies and virtual networks are evolving, which is promoted by development of information and communication technologies and markets (Silkina 2016).

It has been analytically proven that, since the 1990s, the SCM conception has historically undergone three stages notionally named inception, formation and actual development (Krotov 2010), while logistics has played an important role in the evolution. The logistics approach to supply chain management has revealed two main contexts: (1) supply chain logistics focused on optimizing commodity flows of raw materials, supplies, finished products; (2) service logistics that ensures effective satisfaction of customer demands, taking into account the fact that this process is overseen by marketing that forms marketing logistics in combination with logistics (Christopher 2004).

Evolution phases of the supply chain management concept are established precisely from the marketing point of view, while the dominant goal and objectives of supply chain management are taken into account.

It is fair to take into consideration those events in business development that immediately preceded the concept inception. They relate to the latter half of the twentieth century and are associated with weakening of vertically integrated companies and simultaneously strengthened positions of companies specializing in individual manufacturing processes. Withdrawal of non-core assets and 'independent' supplier set-up required that specialized companies tightened control over the suppliers' procurement activities in order to avoid the risk of breaking logistic back, which determined the dominant management approach; the principle of total costs saving was used in logistical decision-making.

The concept inception stage (1980-1990s) is associated with implementing the idea of coordinating flows of raw materials, supplies and finished products based on the principle of a common information area. The dominant management approach was harmonization of commodity flows through basic coordination of logistical processes in dealing with suppliers.

The supply chain management concept formation (the late 1990s and the early 2000s) marks the formation of a classical view of supply chain management, which was typified by the idea to switch to total supply chain management from the first supplier to the end-consumer. Basic coordination was replaced by coordination of chain participants' business processes, while supply chains themselves attained the status of a strategically important factor in business development. The benchmark in management shifted from cost saving to customer-centered



orientation, while the dominant management approach was to build cost-effective supply chains through integration of key business processes.

The development stage manifested itself in involving many previously proven directions and focusing on marketing, with the benchmark to increase the consumer value delivered in a chain (Juttner *et al.* 2007). The dominant management approach continued the integration trend towards a joint production process organization with the involvement of consumers and suppliers (Prahalad and Ramaswamy 2004, 320), whereby the concept of total cost reduction, which implies the maintenance of costs at a certain level as close as possible to the optimum, has been invariably applied.

The current application of the SCM concept is associated with handling the problems of integrated management of functional areas of logistics and logistical process coordination in adapting to the globalization context. In this regards, it is necessary to identify differences between the globalization process from the internationalization process that is related to it.

Internationalization and globalization are virtually economic integration forms. The difference lies in the fact that internationalization is a manageable process developing on the basis of interstate, including intergovernmental and non-governmental, agreements; globalization is a spontaneous process driven by business development interests in a competitive environment. The coherence of processes makes itself evident in the fact that internationalization creates conditions for globalization, that is, appears a historically preceding form of international business integration, while the forms of national, domestic integration are corporatization and regionalization (Shcherbakov 2009, 335–339); the latter is for spatial economies of states with large territory scale, like Russia, where a region is viewed as a quasi-corporation. For countries with a smaller scale, regionalization can become a transitional form on the way toward globalization, where a region is viewed as a market (Granberg 2001, 83), as exemplified by the territory of states associated into the Customs Union with subsequent expansion up to Eurasian Economic Union (EAEU) and the prospect of its integration into the global economy. Consistent therewith, the authors refer to the following statement of President of the Russian Federation made at St. Petersburg International Economic Forum-2016: “We propose considering the prospects for more extensive Eurasian partnership involving the EAEU and countries with which we already have close partnership – China, India, Pakistan and Iran – and certainly our CIS partners, and other interested countries and associations.” (Obukhova and Skorobogaty 2016). It is envisioned that the project of extensive Eurasian integration will be open to European states as well. Against the backdrop of the continent economies connection prospects, BRICS, a union that forms a single market for non-neighboring states, is an effective example.

The United Nations (UN) uses the term ‘globalization’ to refer to an increasingly complex set of cross-border interactions between individuals, enterprises, institutions, and markets, manifested in expanded commodity, technological and financial flows, a steady growth and strengthening of the influence of international civil society institutions, in a significantly extended scope of cross-border communication and information exchange primarily over the Internet (Shcherbakov 2015a). One of the globalization signs is transnationalization, an economic process moving on to a political footing, that marks a withdrawal of behemoths from the range of governments’ influence and expresses a form of domination when companies lay down the rules not only to the direct competitors from business area but also to states. The transnationalization process, in turn, is defined as an essential-substantial determinant in forming a global logistical system whose positioning in the space of logistical system classification signs is mainly related to the scale of their operation that is determined by reference to the economic system level and/or the range of logistical system elements dispersion over a geographic area (Shulzhenko 2016).

A logistical space is created and, that in the globalization context, takes on the characteristics of a system organization, a logistical system where integration processes proceed, with their scale set by the configuration of global supply chains. Formation of a common interstate logistical space provides for unification of all business entities into a single megalogistical system that is an economic system that creates elements of added value in a distributed manner in different countries (Scherbakov 2015b). This is a controlled system, the operation of which is provided by logistical processes that demonstrate their result in an expedient movement of flows, including commodity flows of export-import supplies.

Supply Chain Management is built upon integration of key business processes starting with the end user and covering all goods, service, and information suppliers that add value for consumers and other stakeholders (Stock and Lambert 2005, 797). Early definitions of supply chain management (SCM) typically emphasized the management of activities and material flows, whereas more recent SCM definitions have largely focused on managing the supply chain (SC) as one system with clear strategic goals (Braziotis *et al.* 2013). Hence, there has been a shift towards managing SC members to gain mutual benefits and a concentration on a SC-centric rather than an organization-centric view (Pradabwong *et al.* 2015). Companies that have developed their internal business

process with their suppliers and customers are in a better position to produce and distribute their products at a lower cost and satisfy service level requirements (Simchi-Levi *et al.* 2008).

In specialist domestic and foreign literature, there are various points of view on the content of logistical processes and parties involved therein; they are systematized according to the principle of affiliation with scientific schools and most often result in classifications. The perspective of Professor V.I. Sergeev, a representative of the logistics school of Research University 'Higher School of Economics', is one of the most advanced in research, according to which a logistical process is "a sequence of logistical operations/functions that is specifically organized in time, accomplishing the goals of the logistical system or its network (functional) units, specified for a target period" (Sergeev 2006). The process decomposition inherent therein forms an approach to effective supply chain management, where a supply chain (logistical system) is explored and designed as a sequence of flows and processes.

Among the many well-known classifications of logistical processes, a classification elaborated by the logistics school of St. Petersburg State Economic University is best matched to the problems of supply chain management in their current statement (Shcherbakov 2015b) (Table 2).

Table 2. Classification of logistical processes

Classification criterion	Classification groupings
Flow substance	<ul style="list-style-type: none"> <li>▪ Processes with tangible objects</li> <li>▪ Processes with intangible objects</li> </ul>
Flow objects	<ul style="list-style-type: none"> <li>▪ Processes with homogeneous objects</li> <li>▪ Processes with non-homogeneous objects</li> </ul>
Scope	<ul style="list-style-type: none"> <li>▪ Commercial processes</li> <li>▪ Marketing processes</li> <li>▪ Operational procedures</li> <li>▪ Management processes</li> </ul>
Composition and degree of complexity	<ul style="list-style-type: none"> <li>▪ Complex processes</li> <li>▪ Basic processes</li> </ul>
Economic character	<ul style="list-style-type: none"> <li>▪ Commodity processes</li> <li>▪ Non-commodity processes</li> </ul>
Commercial performance assessment	<ul style="list-style-type: none"> <li>▪ Business processes</li> <li>▪ Processes that maintain business processes</li> </ul>
Reproduction criterion	<ul style="list-style-type: none"> <li>▪ Production processes</li> <li>▪ Distribution processes</li> <li>▪ Exchange processes</li> <li>▪ Consumption processes</li> </ul>
Development pattern	<ul style="list-style-type: none"> <li>▪ Discrete processes</li> <li>▪ Continuous processes</li> </ul>
The method of spatiotemporal object movement organization	<ul style="list-style-type: none"> <li>▪ Sequential processes</li> <li>▪ Concurrent processes</li> <li>▪ Series/parallel processes</li> </ul>
Reconcilability of flow parameters	<ul style="list-style-type: none"> <li>▪ Processes with synchronizable operations</li> <li>▪ Processes with non-synchronizable operations</li> </ul>

Source: Shcherbakov 2015b.

This classification proceeds from ascertaining the initiating role of a logistical process in relation to flows (in general, flows and stocks in logistics). It is meaningful because of its practical focus, and this is what differentiates it from formal classifications that pursue a different, albeit no less important goal that consists in the accumulated scientific knowledge alignment.

## 2. Methodology

It is to be highlighted that any methodology taken to solve a problem depends on the problem itself, data availability, computational resources, and the preferences of researcher in using the particular methodology (Shukla and Jharkharia 2012). The complexity and ambiguity of approaches to supply chain management at the development stage of the SCM concept, such as the current stage, including the logistics approach and cost reduction orientation, improvement of technological support for chains, innovation potential mobilization and joint value engineering in supply chains, extension of supply chain management practices to new industries and markets, and, finally, supply



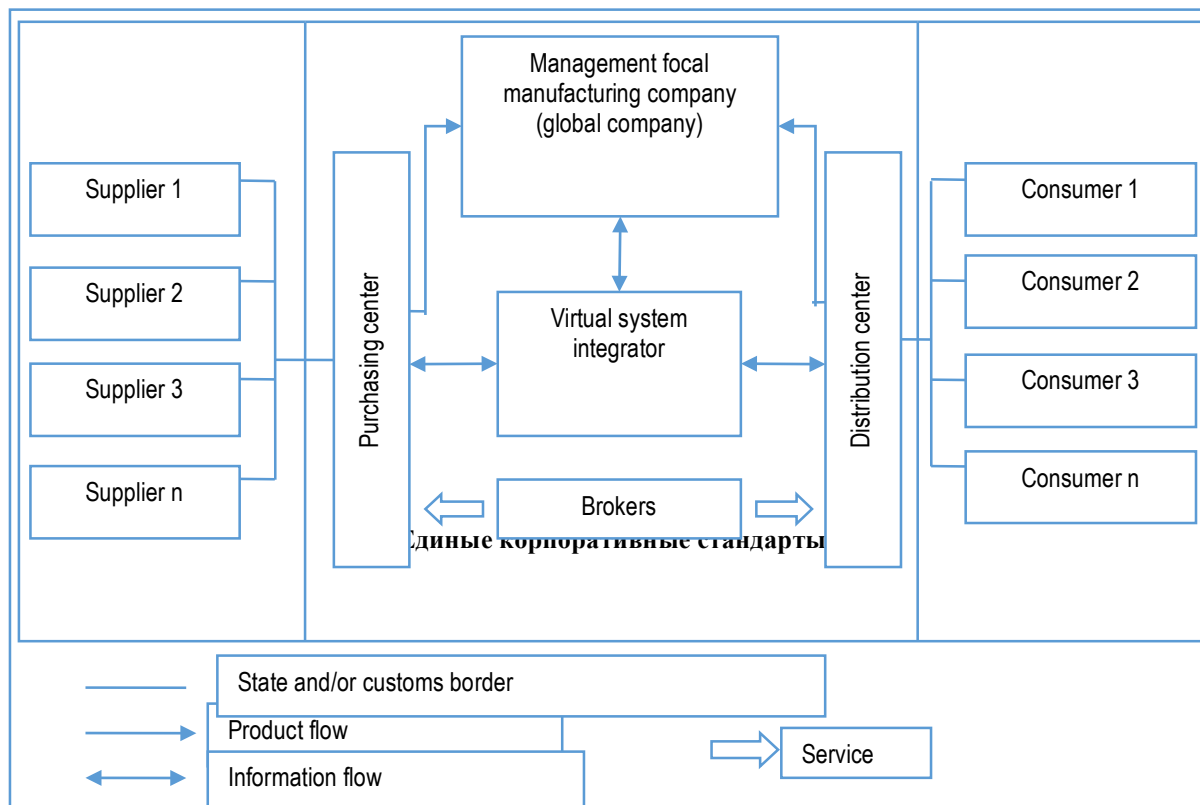
chain globalization (Krotov 2010) necessitate their typologization. Having a typology is an essential condition for relative positioning of global chains in substantiation of a management methodology and the respective methodological tools.

By the geographic principle, supply chains are divided into domestic (national) and international. International supply chains can be designed both in a uniform customs territory of two or more states (crossing only state borders) and in different customs territories of different states (crossing both customs and state borders). In terms of parties and objects, international supply chains are divided into global and cross-border (foreign trade).

The main distinctive feature of the global supply chain is that procurement of raw materials, supplies, components, their processing and subsequent sales of finished products are carried out extraterritorially based on logistics standards unified for all the supply chain links in any commodity markets regardless of their territorial allegiance; therewith, a global company should act as an initiator and developer of standards, according to the basic imperatives of the supply chain. Thus, the global supply chain is the product of the corporate code of rules effective in building the international supply chain.

Parties involved in global supply chains are suppliers, producers and consumers of goods and services interacting through purchasing and distribution centers, united by a virtual integrator and coordinated by a global focal company (Figure 1).

Figure 1. Layout diagram of the global supply chain



Management objects in global supply chains are commodity and associated flows formed by the corporate standards of a global company. These flows lay the groundwork for a logistical process of international merchandise distribution and make it integrated through the coordination function of the global management company that provides strategic management of the supply chain. The role of a virtual system integrator is to provide information support for coordination within the supply chain, while prospects are linked to implementation of the network conventional business organization model, which is based on a social contract (Bliakhman and Zyabrikov 2015).

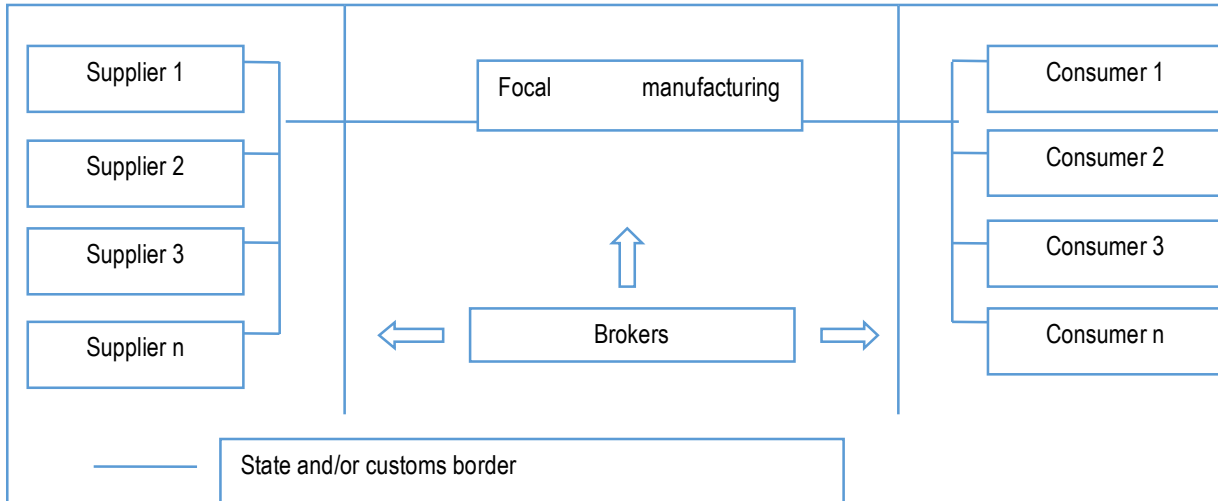
Thus, a global supply chain (from French *global*– universal, Latin *globus*– a globe, that is, comprehensive, inclusive, all-encompassing, extending to the whole world) is a technologically, organizationally, and economically conditioned set of suppliers, producers, and consumers of goods and services integrated into a logistical system by a virtual system integrator, cooperating and coordinated in the cooperation by a global management company that elaborates and applies its own corporate standards at the global market level.

Being a logistical system, a global supply chain has all its inherent characteristics, namely: a common goal, a division of the system into subsystems, the evaluability of each subsystem and the system operation quality as a

whole, advanced internal and external relations, and a single management structure. The two latter characteristics – a single management structure and, hence, formation of internal and external relations – are signs of a difference between global supply chains and cross-border ones.

Parties involved in cross-border (foreign trade) supply chains are suppliers, producers, and consumers of goods and services located in the territories of different countries (Figure 2).

Figure 2. Layout diagram of the cross-border supply chain



Management objects in cross-border supply chains are commodity flows and associated flows that are generated autonomously. The logistical process of international merchandise distribution does not have a single management structure and is a set of separate uncoordinated logistical processes between companies participating in a cross-border supply chain. The latter identifies competitive advantages of global chains over cross-border ones in organizing the logistical process of international merchandise distribution.

Business use of the competitive potential of global supply chains is facilitated by the trade and economic integration processes regulated by interstate, including intergovernmental and non-governmental, agreements. Russia’s membership in the Customs Union (CU), the Eurasian Economic Union (EAEU) and other trading blocs, and its accession to the World Trade Organization (WTO) have a positive meaning for the Russian business development and involvement in international production cooperation.

Indices characterizing Russia’s foreign trade development over the past 20 years are shown in Table 3.

Table 3. Russia’s foreign trade turnover indices in 1995 – 2017

Indices	1995	2000	2005	2010	2015	2016	2017
Total turnover, billion USD	124.9	137	340.2	625.6	525.8	444.3	590.9
Previous period growth rate, as %	100.0	+9.7	+148.3	+83.9	-16.0	-11.0	+24.8
In the total turnover:							
import, billion USD	46.7	33.9	98.71	229.0	182.4	180.5	237.8
export, billion USD	78.2	103.1	241.3	396.6	343.4	267.7	353.1
Turnover with CIS countries, billion USD	28.1	25.4	51.62	91.2	65.57	57.5	72.3
Previous period growth rate, as %	100.0	-9.6	+117.0	+76.7	-28.1	-10.8	+24.6
Turnover with non-CIS countries, billion USD	96.8	111.6	288.6	534.4	460.26	410.7	511.8
Previous period growth rate, as %	100.0	+20.5	+158.6	+85.2	-15.9	-13.0	25.8

Source: compiled according to customs statistics.

Before the sanctions were imposed against Russia, they had exhibited an incremental turnover trend, whereby it is to be noted that the existing business mechanism for managing export and import commodity flows has become insufficiently effective. The increased volumes have necessitated:

- *first*, a proportional increase in capacity and/or the number of international border crossing checkpoints, that is, development of customs infrastructure;
- *second*, acceleration and simplification of customs operations associated with goods and vehicles crossing customs borders through introduction of technological and process-control innovations into customs administration;

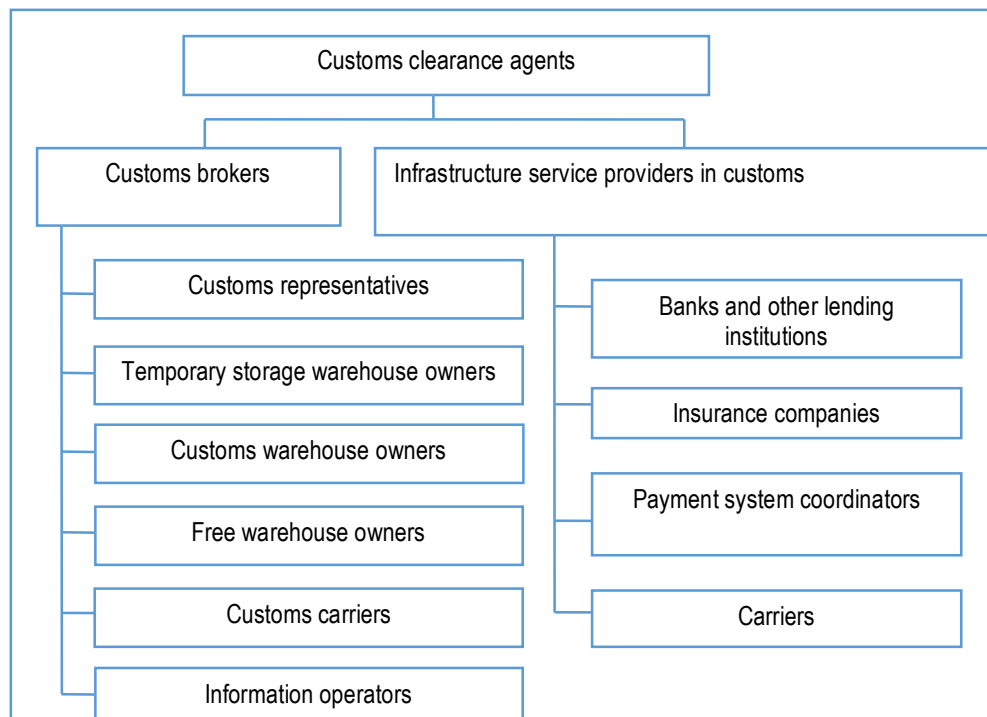
- *third*, introduction of random customs inspection instead of detailed control and introduction of a risk management system adopted internationally. Increased activity of foreign trade participants, their interest in complex interaction patterns should be supported by development and implementation of appropriate customs regulation measures, including customs administration of logistical processes.

Customs administration is an element of customs regulation of foreign economic activity aimed at solving customs problems, of which the following are directly related to logistics:

- simplification and acceleration of the procedure for goods movement across the customs border through customs infrastructure development, its technical and technological equipment (streamlining product flows, in terms of logistics);
- reduction of the terms of preparation and receipt of documents necessary for customs operations and their number through introduction of technologies for customs declaration of goods (streamlining the information flow);
- improving the procedure for collecting customs payments by reducing the timeframe for notification about arrival of funds to the account of the Federal Treasury (streamlining the financial flow).

The managerial essence of customs administration is a systemic organizational and technological impact of customs authorities on participants in international merchandise distribution in the course of customs operations. At the same time, the variety and complexity of customs operations predetermine the need to include customs clearance agents in the global supply chain structure (Figure 3).

Figure 3. Classification of customs clearance agents



Source: Krotov 2010, 53.

Mandatory customs operations and the need for interaction with customs authorities in supply chains require decision-making in the context of 'make or buy' options – whether to perform customs operations by own efforts or by efforts of third-party organizations (customs clearance agents). When making decisions in favor of outside companies, the supply chain expands by means of customs clearance agents specializing in such types of services as transportation and customs warehousing of goods, customs declaration, including customs procedure selection, commodity code definition, payment of customs duties, etc.

The interaction of supply chain participants with customs clearance agents is based on application of the EOQ (Economic Order Quantity) calculation model. The decision of an importer/exporter on performing customs operations through customs clearance agents or by own efforts is justified by an analysis of transaction costs for customs declaration ( $C_{\text{declar}}$ ), customs warehousing of goods ( $C_{\text{star}}$ ), transportation of goods under customs control ( $C_{\text{transp}}$ ):  $C_{\text{tot}} = (C_{\text{declar}} + C_{\text{star}} + C_{\text{transp}})$ , where:  $C_{\text{tot}}$  is the total cost of customs operations.

The decision-making logic is consistent with the principle of reducing total costs that dominates global chain management: the option where  $C_{tot}$  value is lesser is chosen from the two options. At the same time, a combined option is not excluded, whereby a part of the customs operations is performed by the company on its own, while it relies on intermediary services as for the rest.

Economic relation between an importer/exporter and customs dealers is initiated via a request that a global supply chain participant refers to a customs clearance agent (agents) to receive a package of intermediary services in customs. This request conditions information flows. At the first stage, a challenge is issued, that is, the need of the global supply chain participant for intermediary services is justified in quantitative terms. At the next stage, basic data necessary to solve the problem are collected and processed. At the same time, economic efficiency of the proposed operations is initially estimated. If the cost of services provided proves to exceed the economic benefits of transaction that the global supply chain participant intends to derive, they can withdraw from the cooperation.

In the event that the global supply chain participant is satisfied with the preliminary estimate, they proceed with iterative development of proposals for the problem solution, that is, simulation of planned processes in order to select the optimal set of customs operations, with each proposal undergoing an intermediate cost-effectiveness analysis. If there is not one option among the submitted proposals that would suit the global supply chain participant, they revert to the development stage. In case there are economically viable options among the proposals submitted, an optimum alternative is chosen therefrom which would best meet the needs of the global supply chain participant. At this stage, final cost-effectiveness analysis of the selected option is made. In the future, the commodity, information, financial flows are programmed, that is, behavior of the chain participants is regulated. If all formalities are observed, a customs service agreement is concluded between the customs clearance agent and the importer/exporter, followed by the stages of the economic relation put into practice, that is, contract execution, that determine the service and financial flows.

The nature of customs mediation effect on the competitiveness of global supply chains and the effectiveness of customs administration as a whole depend on the customs sector innovativeness, including creation and development of innovations that promote development of customs infrastructure and optimization of logistical processes.

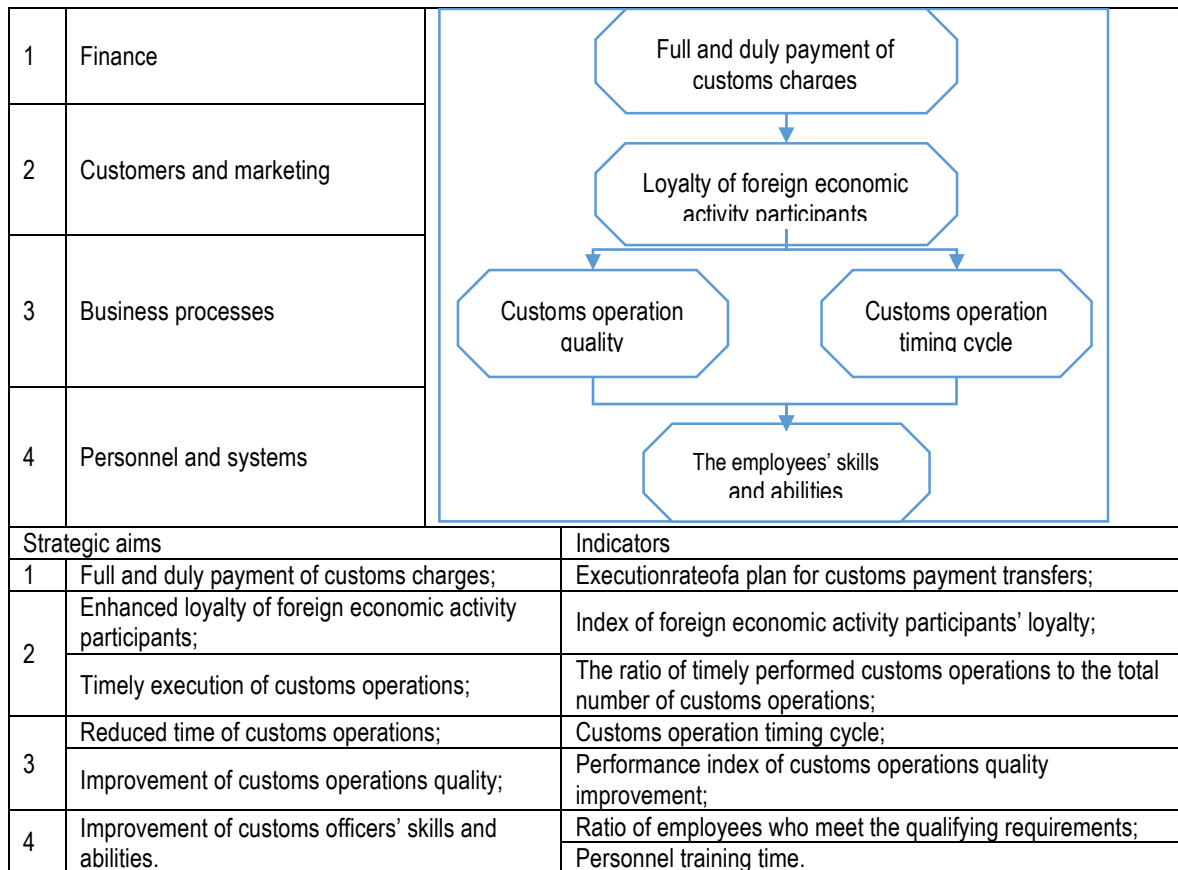
According to expert analysis, innovative measures of regulatory, legal, infrastructural, information-technological and managerial nature, taking into account the effect of customs and logistics risk factors, are most relevant in global supply chain management. The conclusion is based primarily on the fact that the trade and economic integration of Russian economy into the world economy requires an adjustment of the legislative framework in the field of customs regulation at the domestic level and development of corporate logistics standards at the level of global companies. Infrastructural changes in the customs sector caused by the Russian Federation membership in the Customs Union and a relocation of customs declaring to places adjacent to the customs border significantly reduce the risks of time and financial losses associated with declaration, movement and storage of goods under customs control, and allow global supply chain participants to improve export-import commodity and associated flow patterns. The use of modern information technologies gives great opportunities that will allow supply chain participants to gain an advantage when interacting with customs authorities and customs clearance agents.

### **3. Case Study**

Creation of e-customs as an information system of customs authorities, ensuring implementation of an advance information distribution technology, electronic and Internet declaring, remote release of goods on the principles of risk management is proposed to consider as an integrated innovative solution.

It is obvious that the solution design of e-customs, along with engineering solutions, should pay special attention to economic feasibility, whereby it is proposed to use the Balanced Scorecard (BSC) and KPI (Key Performance Indicators) methodology (Figure 4).

Figure 4. Example of a strategy chart and score card of e-customs



The BSC methodology is premised on dividing key performance indicators by the areas of activity: finance, customers and marketing, business processes, personnel and systems. When the system is adapted to the 'finance' projection, fiscal indicators, that is, indicators related to budget revenues from customs payments collection are included. The 'clients and marketing' projection consists of indicators of customer satisfaction, timely performance and quality of customs operations from the perspective of foreign economic activity participants. The 'business processes' projection is formed by indicators related to assessing the efficiency of a set of technological and administrative business processes. The 'personnel and systems' projection consists of indicators representative of innovative and investment development and further training of customs officers.

Recommendations on practical application of the BSC and KPI are documented by developing a strategy chart and scorecard layout. The strategy chart gives a description of strategy in establishing cause-and-effect relationship at each level of e-customs management: federal, regional, and local. It is convenient to use for setting and monitoring the achievement of goals, including cascading, considering that the strategy implementation requires responsibility cascading down the line.

The SCP ensures interaction of customs officers at all levels of e-customs management and gives an idea of how to organize the decision-making process to achieve the goals. The use of KPI to assess the e-customs efficiency allows for coordination of actions and dynamic orientation to the external and internal business environment changes.

The proposed solutions are aimed at supporting the customs administration mechanism operation, which manifests itself in the extent to which the norms of customs control apply to goods and vehicles transported across the customs border, the persons who move them across, and documents that are to be produced during customs operations.

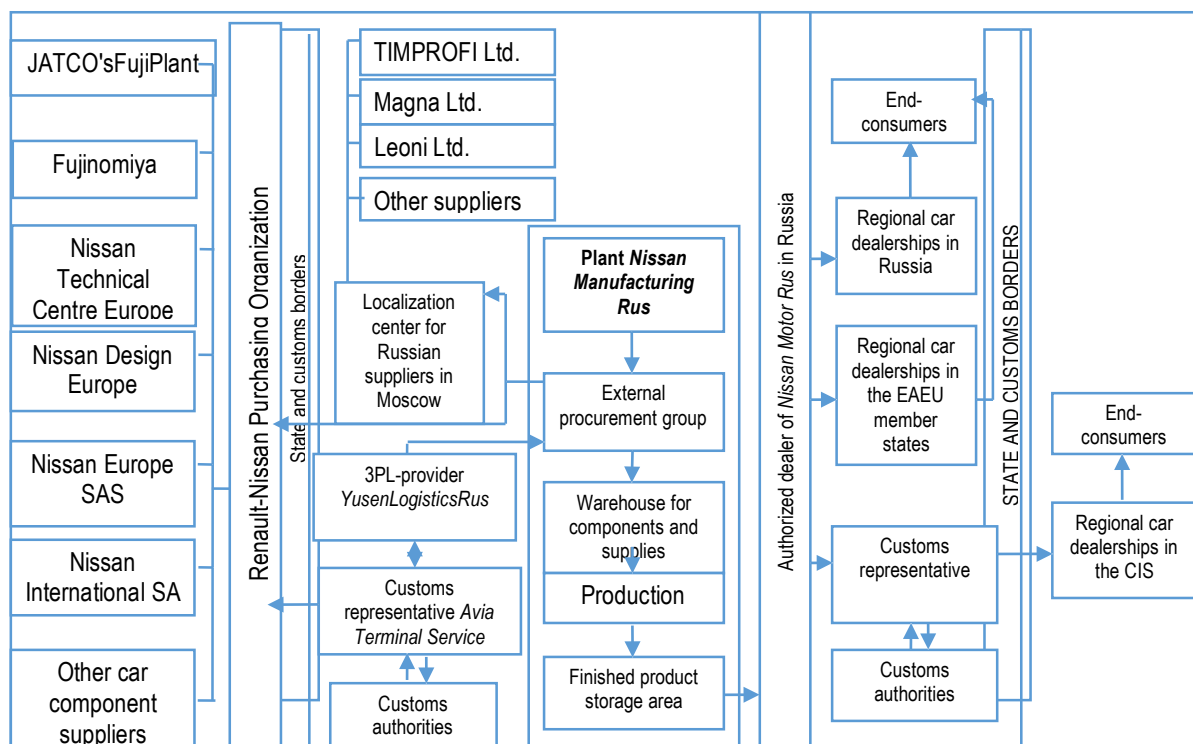
The norms of customs control applied to the above categories are invariant both in the case of their movement across the state and customs borders (international supply chains designed in different customs territories) and in case of their movement only across state borders within a single customs territory (international supply chains designed within a single custom territory); the difference will be the need to apply specific norms.

If global supply chains are designed within a single customs territory, customs control is simplified: goods are not examined, the required accompanying documents are checked, goods and vehicles are not subject to

declaration. If supply chains are designed in different customs territories, overall customs control is exercised: goods are inspected at customs border checkpoints, all the required accompanying documents are checked, goods and vehicles are declared in accordance with the stated customs procedure.

The most common situations are when some of the global supply chain links are designed and operated within a single customs territory, and some in different customs territories. Alternatively, the procurement activities of a supply chain are carried out in different customs territories, while the sales activities – within a single customs territory. An example of such a combined structure is the global supply chain of *Nissan Manufacturing Rus*, a Nissan car manufacturer in Russia. These company's production facilities are located in Russia (St. Petersburg), the sales network covers the Russian Federation and the CIS countries, and the supply chain covers the whole world, including Russia. A reference to the *Nissan* activities, made when describing the historical background above, allows the authors to illustrate the developments presented herein (Figure 5).

Figure 5. Global supply chain of *Nissan Manufacturing Rus*



It is apparent from Figure 5 that some suppliers and consumers are outside the state and customs borders. When goods are moved, the customs regulation norms are applied to the full extent: customs control of goods, their declaration, payment of customs charges, bonded warehousing and transportation under customs control; non-tariff regulation norms apply. Compared to this option, movement of goods from suppliers to consumers within a single customs territory, which includes the territories of various sovereign states, makes it possible to minimize the application of customs regulations: when crossing state borders within a single customs territory, the necessary documents accompanying the goods are checked without customs formality charges.

Thus, in productsupply and sales organization outside a single customs territory, overall customs control is to be exercised, whereas when organizing productsupply and sales within a single customs territory, simplified customs control is to be exercised, which accelerates logistical processesin international merchandise distribution in the global chain.

#### 4. Discussion and Conclusions

In the globalization context, building and operation of supply chains as a set of economic entities united by participation in a single replenishment cycle of goods (services) through management is based on the implementation of basic, invariant with respect to all supply chains without exception, and private imperatives applicable to global supply chains.

Combinability of basic and private imperatives predetermines the complementarity of global and corporate logistics ideas and their continuity in terms of the customs logistics theory content that broadens the notion of



administrative nature of customs administration of logistical processes in global supply chains, taking into account the cross-border specifics of export and import commodity flows. In general, the ideas prove that the potential competitive advantages of global supply chains are built upon unification of the forms of interaction between participants and standardization of rules aimed at implementation of logistical processes of export-import supplies regulated by customs administration tools.

The scientific ideas developed to conceptual and methodological positions, as well as the business solutions on managing global supply chains that have been developed on the basis thereof, gain practical importance when fitting into performance of the Action Plan ('road map') 'Improving Customs Administration' that is implemented by the Federal Customs Service of the Russian Federation in accordance with the order of the Government of the Russian Federation of June 29, 2012, No. 1125-p. Customs administration aimed at introduction of technologies for release of goods and their customs declaration, at reduction of terms and simplification of customs operation procedures with export-import commodity flows, is consistent with the logistics rules and the global supply chain imperatives.

In general, the proposed methodological and methodical tools provide support for the logistical processes in global supply chains through customs administration, solving design problems associated with the choice of counterparties in the context of trade and economic integration, cooperation procedures in import/export operations for delivery of goods, movement of goods across customs borders, and customs declaration.

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## Predicting Levels of Innovation-Led Development as Exemplified by State-Owned Oil Company

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### Abstract

The paper considers scenarios of innovation-led development at oil and gas companies. Potential lines of development are discussed. Factors supporting innovative activities are explored based on the official data. Analysis is performed of the level of innovation-led development at a state-owned oil company. Evaluations are laid out for potential development capacities and price factors influencing the potential standing of competitors and leaders to 2025. Results are arrived at suggesting a weakening of the innovation development potential of the state-owned oil company. A model is proposed to evaluate and predict the position and growth outlook of the state-owned oil company, a key player in the CIS and European markets. The model developed by the authors as part of the study to evaluate the financial potential for innovation-led development in companies offers a reliable and comprehensive tool to evaluate performance in managing innovation capabilities and enables companies' adaptation to the dynamically changing external environment.

**Keywords:** financial policy; innovation-led development; state-owned oil company; innovation potential index of a company

**JEL Classification:** D90; D92

### Introduction

One of the strategic directions of state financial policy in innovation-led development is the arrangement of financial resources to support it. The mechanism of financing innovation-led development at the corporate level includes various sources and instruments of financing. Corporate structures in financing innovation-led development rely on both traditional sources and forms of financing (bank loans, leasing), and specific types fit for financing innovation business.

Scientific research, technological advances, and economic and education development make the main directions in innovation-led development of the economy and companies.

The major source of financing for innovation-led development in Russian companies is budget funding, and its share has been growing. The share of proprietary funding of companies has been in a declining trend over the studied period, getting down to 15% in 2016. The share of foreign investment in innovation development in companies has also declined (Jamrisko and Lu 2017).

It reflects sector-specific sanctions and the worsening investment climate in the Russian economy. Advanced economies are different. The balance of sources of financing innovation development is primarily shaped by proprietary funding of companies standing at 63%, 65%, 55% and 65% versus 27%, 20%, 32% and 22% for

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foreign investment in the USA, Japan, the UK, and Germany, respectively (Patent Research, Intelligence and Services Training).

## 1. Methods

The methodology of the study is based on the principles of the dialectic approach. The research relies on general scientific methods, including, observation, gathering factual evidence, analysis and synthesis, deduction and induction, classification, the comparative method, the method of analogies, the Delphi technique and quantitative methods, particularly the economic and mathematical methods, diagram and statistical methods, and process modeling. The information base of the study comprises federal laws and subsequent regulations on the evaluation of the innovation-led development in companies, statistical data contained in the documents of the Federal State Statistics Service; information from annual financial statements of Russian and international oil and gas companies and monitoring of the “Expert” rating agency for 2010-2016.

## 2. Results

### 2.1. Effects of public economic policy for innovation-led development in companies

The use of financial indicators in evaluating enterprise levels of innovation activities is quite common. Annually released financial statements provide the basis of comparison, which is an important source of information for analysis. Notwithstanding the well-known calculation methods including innovation potential indices, further research is needed to analyze changes in overall cumulative indicators over time. This implies the formation of a different estimate in case of changes of corporate development programs with suggested indicators of the model.

Thus, in order to identify the companies’ standing in the ranking, one should review and forecast the enterprise’s investment projects with a view to predicting the potential future standing.

There has been active discussion over the choice of development course of the modern economic policy structure (Morozov *et al.* 2017). One of the prevalent views is that hi-tech and innovation-led industries should be supported by way of redistributing profits earned by energy intensive sectors of the economy involved with the development of natural resources. International practice suggests that the oil and gas industry is one of the most technology-intensive industries globally. Recently, a tendency toward innovation has been a general development course in the global oil and gas industry (prevalent in the industrial advanced countries). (Zemtsov and Silkin 2005)

However, globalization, integration and, subsequently, the implementation of international and regional investment projects create an important benchmark for enterprises through the identification of major strategic companies, investment and energy projects and analyzing and evaluating, based on their performance, the potential outlook in terms of the levels of innovation-led development.

An analysis of current investment projects, forward-looking investment plans and exports is a requisite part in the evaluation of the company’s outlook going ahead. In other words, the need to evaluate internal investment potential and future investment expectations (financial outflows) is an important factor for the formation of scenarios in prediction analysis.

A comparison of companies in terms of financial potential helped to identify specific aspects of the financial potential of innovation-led development in companies. Firstly, the link was discovered between the amount of R&D financing and changes in capital structure. Thus, as the company’s debt loads rise, the R&D budgets become tighter and innovation development is financed from the equity. Secondly, it should be noted that the financial potential measure in Russian and international companies is subject to considerable fluctuations. Volatility in the indicator among international companies is predominantly due to sharp fluctuations of global prices in global energy markets. Meanwhile, recession in the Russian economy and sanctions against certain sectors and particularly the oil and gas sector also influence considerable fluctuations in the financial potential of innovation-led development in Russian companies, apart from the price factor. Thirdly, in current circumstances, it is reasonable to achieve financial potential growth by way of increasing return on equity, optimization of the debt-to-equity ratios in the companies’ capital structure (Rusanov *et al.* 2017) and the development of strategies aiming at priority financing of innovation-led development at Russian oil and gas companies.

The best-case scenarios relate not only to positive external conditions, but rather expansive plans in companies and the need for state bodies to address a wide range of socioeconomic tasks by relying on state-owned companies. It is in the best-case scenarios that synergy effect is achieved through joint efforts of business and the state. For that reason, the best-case scenarios are prioritized as they meet strategic goals and expectations of the state and private sector.

That said, until recently, the natural careful approach and conservatism of large entities had led to structuring the base forecast as the realistic scenario retaining the elements of the target scenario.

The worst-case alternatives relate mostly to assumptions of the least favorable external conditions and, subsequently, lower reserves of the state and the analyzed entity and, thus, slower investment activity in the private sector.

## 2.2. Evaluation of innovation-led development level at a state-owned oil company to 2020

Ranking scores for oil and gas companies based on the model of innovation effort levels suggest that the discussed state-owned oil company (hereinafter, the COMPANY) currently has low ranks as per the index of innovation potential of the company (IIPC) (Table 1).

Conditions have been determined for assigning particular companies to a particular model of evaluations, given that:

$$(RE + FCF) / C \quad (1)$$

where: RE is the retained earnings; FCF is the free cash flow; C is the capitalization (capitalization by fixed assets).

This model fits the companies ranking low by the factors of “industry significance” and “growth factor”, such as ConocoPhillips, LUKoil and Rosneft. The discussed COMPANY also falls within this group by its measures.

Table 1. Company ranking as per the IIPC model, by the years

Company, IIPC	1st period		2nd period		3rd period	
COMPANY	0.83607	5	0.35134	7	0.60182	7
BP PLC (British Petroleum)	0.41404	7	0.700661	4	0.81141	5
ExxonMobil	1.31398	3	1.807333	1	1.90382	1
Statoil	0.46329	6	0.445609	6	0.74771	6
Total	1.56077	1	0.673664	5	1.38528	2
Chevron	1.31285	4	1.187679	3	1.06788	4
LUKoil	1.32899	2	1.269235	2	1.2141	3

Based on the calculations, the COMPANY’s standing was determined for the past three fiscal years. Weak rankings of the COMPANY reflect low values of the parameters in the model underlying the evaluation of the innovation development level. Subsequently, the implementation of global-level strategic industry goals and the implementation of the innovation policy in the domestic market appear unlikely.

Then, an attempt is made to predict potential future standing of the company by analyzing prospective, international and regional energy projects (Table 2).

Table 2. Investment projects of the COMPANY shaping investment programs and investment flows

N o.	Project name	Planned implementation timeline	Expected production levels	Company's share (%)
1	Project 1. Development of gas and condensate fields: south	2020-2025	13 bln cubic meters of gas and 17 mln tons of condensate	
2	Project 2. Development of gas and condensate fields: north	2020-2025	20 bln cubic meters of gas and 20 mln tons of condensate	
3	Project 3. Expansion of gas fields	2018-2025	16 bln cubic meters of gas a year	10
4	Project 4. Expansion of gas condensate fields	Till 2024	25-30 mln tons	11.5
5	Project 5. Launch of cycling process: south-west		206 mln barrels	20
6	Project 6. Launch of cycling process: north	After 2015	7.3 mln tons	25
7	Project 7. Construction of a station of stable gas production	After 2015	205 mln tons	25
8	Project 8. Restructuring of gas and condensate wells with slow recovery rates		200 bln cubic meters of gas and 40mln tons of condensate	
9	Project 9. Restructuring of water drive system at gas and condensate wells		400 bln cubic meters of gas and 80 mln tons of condensate	

Thus, the preliminary analysis conducted suggests that export capacities, according to the scenarios to 2020, will be as shown below (Table 3).

Table 3. Potential export capacities of the COMPANY to 2020

Scenario	Export capacities	
	Oil (mln tons)	Gas (bln cubic meters)
Base-case (realistic)	30-35	25-30
Best-case	40-45	20-25
Worst-case	25-30	15-20

The above calculations are not much differing from the official forecasts of the government which indicate an average planned oil production in the analyzed three-year period at 40.5 mln tons and gas output at 27.4 bln cubic meters. Meanwhile, global energy demand over the past decades has risen considerably and may rise by up to 33% by 2030 compared to 2016. (Statistical Review of World Energy 2016, Energy Outlook 2030, 2013)

In order to determine long-term price projections for Brent oil, we shall use the data collected by the Agency for Economic Forecasting and calculate cash flows from resource exports for different scenarios to arrive at potential values of the "retained profit" measure. (Oil price forecast). The calculations are laid out in Table 4.

*Base-case (realistic) scenario.* The scenario is based on assumptions of a stable economic environment in the global oil and gas market and insignificant declines in raw material output and exports.

Table 5. Calculation of cash flow in the base-case scenario

Year	Flows from oil sale (bln dollars)	Flows from gas sale (bln dollars)	Total flows (bln dollars)
2015	18-20	10	28-35
2016	18-20	10	28-35
2017	20-22	10	30-35
2018	22-25	10	30-35
2019	20-22	10	30-35
2020	22-25	10	30-35
Total till 2020			170-200

The calculation in Table 4 shows that by 2020, *i.e.* in 5-6 years, the income derived from hydrocarbon reserves can reach approximately \$180 bln, but it should be noted that the main factor influencing income growth is definitely price trends in the global oil market. However, this is not the only reason. Quite significant has also been the change of proportions governing the distribution of oil produced under production sharing agreements. Based on the ratios of distribution of profit between the state and the consortium (80/20), the consortium's profit can reach approximately \$35 bln. The share of the state-owned company in the consortium in various projects will stand at approximately 15%. Thus, profit to be received by the state-owned company will cumulatively reach \$5.5 bln to 2020.

*Best-case scenario.* The best-case scenario is based not only on favorable external conditions such as demand growth and higher global prices, but also on favorable output and growth in the amount of raw material exports. The calculation is shown in Table 5.

Table 5. Calculation of cash flow in the best-case scenario

Year	Flows from oil sale (bln dollars)	Flows from gas sale (bln dollars)	Total flows (bln dollars)
2015	25-30	11-12	35
2016	28	12.5	40.5
2017	28	12.5	40.5
2018	28	12.5	40.5
2019	28	12.5	40.5
2020	28	12.5	40.5
Total to 2020			243

Based on the calculations in Table 5 and the ratios of distribution of profit between the state and the consortium (80/20), the consortium's profit can be approximately \$48.5 bln. The share of the state-owned company in the consortium on average in various projects equals to 15%. Thus, profit to be received by the state-owned company will cumulatively reach \$7.5 bln to 2020.

*Worst-case scenario.* The scenario is based on assumptions of a considerable decline in the amount of raw material exports, unstable conditions of the global oil and gas market, *i.e.*, a decline in energy prices (Table 6).



Table 6. Calculation of cash flow in the worst-case scenario

Year	Flows from oil sale (bln dollars)	Flows from gas sale (bln dollars)	Total flows
2015	17	7,5	25
2016	17	7,5	25
2017	17	7,5	25
2018	17	7,5	25
2019	17	7,5	25
2020	17	7,5	25
Total to 2020			150

The calculation in Table 6 and the ratios of distribution of profit between the state and the consortium (80/20) show that the consortium's profit can be approximately \$30 bln. The share of the state-owned company in the consortium on average in various projects equals to 15%. Thus, profit to be received by the state-owned company will be cumulatively equal to \$4.5 bln to 2020. Therefore, the forecast (expected) figures for profit to be received on a cumulative basis to 2020 are laid out in Table 7.

Table 7. Scenarios of development of state-owned company

No.	Scenario	Expected profit to be received
1	base-case (realistic) scenario	\$5.5 bln
2	best-case scenario	\$7.5 bln
3	worst-case scenario	\$4.5 bln

Figures from the above tables can be used to determine retained profit for the state-owned company, see the Table 8.

Table 8. Retained profit according to different scenarios to 2020

Years	Retained profit of SOCAR (the COMPANY), bln dollars	Base-case (realistic) scenario (bln dollars)	Best-case scenario (bln dollars)	Worst-case scenario (bln dollars)
2009	11			
2010	10.75			
2011	11			
2012	11.9			
2020		5.5 + 11.9 = 17.4	7.5 + 11.9 = 19.4	4.5 + 11.9 = 16.4

Potential values for the measure of fixed asset capitalization to 2020 can reach \$32.0 bln. We shall assume the "free cash flow" measure equal to zero, as over the analyzed period the measure stood at minimum levels. Therefore, in accordance with the above condition (see equation 1), we shall determine the expected level of innovation development in line with three different scenarios under the model of evaluation of the level of innovation development:

1. base-case (realistic) scenario:

$$IIPC\ 2020 = (17.4+0)/32 = 0.54$$

2. best-case scenario:

$$IIPC\ 2020 = (19.4+0)/32 = 0.60$$

3. worst-case scenario:

$$IIPC\ 2020 = (16.4+0)/32 = 0.51$$

An analysis of the predicted values of the company's potential suggests that by 2020, the state-owned company will surpass the current year level in line with the base-case and best-case scenarios and will retain its positions and potential in implementing its own energy projects in particular regions and international markets.

### 3. Discussion

The practical implications and applications of the research results are as follows: the research has helped to identify specific aspects of formation of the financial potential of innovation-led development for a Russian company, which include lagging interest in financing innovation work, weak state stimulus of this work, and limited involvement of

foreign investors in the financing of innovation development of companies in Russia. The analysis took into account the priority influence of state financial policy on the financial potential of innovation-led development in companies. It is proven that the financial potential of innovation development in a company is a predictor of the achievable maximum levels of possible return on and performance of all corporate resources (productive, research-related, personnel, management, business) given their functioning within a specific system of companies' potentials and state forecasts of economic outlook.

## Conclusion

The conducted research by the methodology of financial and economic planning at enterprises of the oil and gas sector suggests the following conclusions: the technique developed by the authors to evaluate the financial potential of innovation-led development in companies offers a reliable and comprehensive tool to evaluate performance in managing innovation capacities, promotes companies' adaptation to the dynamically evolving external environment and, ultimately, reinforces competitive advantages in the modern circumstances. The formation of an integral measure makes for a more exact specific evaluation of the financial potential of innovation-led development in companies through the identification of major influencing factors and opportunities to respond to changes in the market environment.

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# Input Output Analysis of Agriculture and Food Sectors in Selected European Countries

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## Abstract:

Input-output tables with input-output data represent a relatively simple but useful tool to analyse the structure of the economy or undergoing structural changes. These tables enable to quantify direct and indirect linkages within each economy, as well as to study demand or supply relationships between particular sectors. The aim of this paper is to present and compare the main characteristics of two sectors for selected EU countries, notably Slovakia, Austria, Germany and France. The focus is on the agriculture and food sector and their characteristics using the input output data and analysis. We compared basic input and output multipliers in order to verify the similarities in the position and the development of these sectors in selected countries. Other objectives were analysis of sectors' backward and forward linkages, "measuring" of their strengths, identification of key industries and concentration of their impacts and verification of similarities between "old" and "new" EU member countries. With accordance to our previous research and general trends, we expected a certain decline of importance over the analysed period of 2000-2014.

**Keywords:** input-output analysis; multipliers; backward and forward linkages; agriculture sector; food sector; Slovakia; Austria; Germany; France

**JEL Classification:** C67; F62; L66

## Introduction

Input-output tables (IOT) and input output analysis are based on the model presented by Leontief (1953). This type of analysis is not new; however, it still represents a very useful and rather simple way for assessing various structural changes in economies. This way we can easily see and study sectorial interdependencies or existing linkages between sectors or their strength. As a result, the calculations help to see how the whole economy and all its sectors can be impacted in case of a change in one particular sector.

This paper focuses on the agriculture and food sectors, the two sectors that were getting more attention mainly due to their general decreasing trend over previous decades. The aim of the analysis is to compare and evaluate the position and the development of these sectors in Slovakia (SK), Austria (AT), Germany (DE) and France (FR) over the period of 2000 - 2014. These countries were chosen so as to represent "older" and "newer" EU member countries. Their analysis should enable to study whether the possible similarities exist and in what domain. We expect that the "old" members would present more similar traits with each other.

We tried to verify the strength of the sectors' demand and supply linkages, the importance of their positions in national economies (especially from the point of view of key sectors). In accordance with general trends and the previous research, it can be expected that these sectors would have experienced fairly stable, but decreasing trend over the observed period. Due to the limited extent, this paper presents only selected results of the analysis. More detailed results can be provided upon request.

## 1. Literature Review

The agricultural and food sectors represent essential sectors to each national economy. Their economic importance in developed countries, however, declined over last decades. This general trend can be observed in many European countries. This transformation can be linked to the growth of innovations and the use of new technologies that have led to the increase of productivity as well as effectiveness in the agricultural sector as a whole. (Benešová *et al.* 2016) In case of European states, this trend can be even more pronounced for those countries that shifted from centrally planned economy to market systems such as Central European, Baltic or Balkan countries. This transition process impacted various areas of economic life of the countries, agriculture and food sectors included (Záhorský and Pokrivčák 2017). On the other hand, "old" members of European Union (EU) were not subjected to

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such significant structural changes. In “new” countries, the transformation process in these sectors brought about the changes in the institutional structure, transfers of property rights, competition of cheap imported products or need of machinery renovation. Such changes can be viewed as a part of the process that was necessary to assure a higher similarity of economic structures of “old” and “new” members. The EU accession impacted also national agricultural policies that needed to be revisited to assure their compliance with the EU policies but on the other hand it helped new members via yearly transfers of financial resources supporting agriculture (Lauri 2012; Néméthová and Cíván 2017)

According to the European Environment Agency, Europe is one of the most intensively exploited continents in the world. The total area of agricultural land in the EU decreases in time in favour of construction and other areas, and partly even forest (Gebelová 2017). This can be seen as a sign or a lessening importance in this domain. This author points out to such a trend also on the national level in various EU countries, e.g. in Czech Republic, Poland but also in Germany or United Kingdom.

When we look at the latest EU data, according to the agricultural census of Eurostat in 2016 (2018), the utilised agricultural area (UAA – corresponding to total arable land, permanent grassland and meadow, permanent crops and kitchen gardens) represented 1,895,500 hectares in Slovakia, 2,878,170 hectares in Austria, 16,700,000 hectares in Germany and 29,089,000 hectares in France. The UAA accounted for 1.1% of the whole EU-28's UAA in Slovakia, 1.65% in Austria and 6.6% in Germany, compared to 16% in France. When compared to the “biggest” European agriculturists such as France (16% of UAA) or, Spain (13.6%), the shares of Slovakia or Austria might not seem very significant. However, from the national point of view, in 2016, UAA accounted for about 39 % of the whole territory in Slovakia, about 32% in Austria, 47% in Germany and 45% in France. German and French shares represent one of the highest shares within EU-28 (Eurostat 2018).

One of the latest trends in agriculture in EU is a gradual increase of interest in organic farming, especially after 2000 (increase by 18.7% between 2012 and 2016 with the expected upward trend). Organic farming can be described as an agricultural production which uses organic production methods and places the highest emphasis on environmental and wildlife protection. This is accomplished by avoiding, or largely reducing, the use of synthetic chemicals such as fertilisers, pesticides or various additives and replacing them with biological or mechanical methods (European Commission 2018).

From the point of view of national economies, the size of the organic area differs considerably from one EU country to another. In 2016, the highest shares of organically farmed land could have been attributed to the largest EU economies, i.e. Spain (16.9%), Italy (15.1%) France (12.9%) and Germany (9.5%), together making up 54.4% of the total EU-28 organic area. France represents also the country with one of the highest increases in this area (+50 %). In case of Germany the increase was about 18 % over this period. In case of Austria and Slovakia the shares were increasing by lower pace: from 15% to more than 18% over the period 2000- 2016 (AT) or from 3% in 2000 to almost 10% in 2016 (SK) (European Commission 2018, Eurostat 2018).

When analysing position or importance of any sector in economy, various basic indicators can be used: e.g. the sector's share on overall output, employment, value added (VA), imports or exports. IO analysis represents another approach for analyses of the sector, its place in the economy or its linkages with other sectors. Thanks to the IO analysis we can verify to what extent the positions and impacts of agriculture as well as food sector on the whole economy correspond to their shares on the whole territory. As mentioned before, IO models are based on the input output theory by W. Leontief (1953). While the basic models take into account only data drawn from national economies (NIOT), the more detailed version covers also the country's relationships with other countries of the world (WIOT). Thus IO tables supply information about activities of all sectors within the whole production process in each economy, from the point of view of producers (suppliers) of inputs and from the point of view of buyers (consumers) of inputs. (Dujava *et al.* 2011) These transactions are recorded in monetary terms, as both intra and intersectorial flows and usually for a period of 1 year (Miller and Blair 2009). The knowledge of these flows can be very useful when evaluating overall macroeconomic impacts of the changing demand in various sectors (D'Heroncourt *et al.* 2011). Therefore, IOT analyses are often referred to as impact analyses (Pissarenko 2003).

IOT models allow calculating various types of multipliers: output, input, import, employment, income or value added multipliers (Lábaj 2017). They can be calculated either as simple or total multipliers, depending on whether the household consumption is a part of the model (so-called open or closed model) (Pissarenko 2003). Input output approach is also focused on the analyses of demand and supply relationships between various sectors, i.e. backward and forward linkages (BL and FL). The strength of these linkages points out to the most important sectors, either on the demand or on the supply side. Sectors that have strong both backward and forward linkages are usually qualified as key sectors to the economy. What is more, IO calculations help to understand whether these

impacts are evenly dispersed throughout of the whole economy or they are rather concentrated on a smaller number of other industries.

One of the advantages of IO analyses is that the values of multipliers remain relatively stable even for longer periods of time thanks to relatively stable structures of economies. As a result, even older values can be used for e.g. the assessment of the current situation or for predicting future impacts of changing demand. The stability of multipliers is linked to the relatively stable structures of national economies and to the lower frequency of important technological changes (McLennan 1995).

## 2. Data and Methodology

We suppose that each economy can be divided in “n” sectors and there are various relationships linking these sectors, the structure of the economy can be in general described by following set of equations (Miller and Blair 2009):

$$\begin{aligned} X_1 &= Z_{12} + Z_{12} + \dots + Z_{1j} + \dots + Z_{1n} + Y_1 \\ X_2 &= Z_{21} + Z_{22} + \dots + Z_{2j} + \dots + Z_{2n} + Y_2 \\ X_i &= Z_{i2} + Z_{i2} + \dots + Z_{ij} + \dots + Z_{in} + Y_i \\ X_n &= Z_{n2} + Z_{n2} + \dots + Z_{nj} + \dots + Z_{nn} + Y_{n1} \end{aligned} \quad (1)$$

where: “Xi” stands for total sector output for sector “i”, “Yi” the final demand for this sector’s production and “Zij” the intersectorial flows in this economy.

The production of each sector can serve as the intermediate consumption (inputs for other productions) or can be used directly in various sectors (consumption of households, investment of firms, government expenditures, export) (Habrman 2013, Duvajová 2014). When the flows of inputs from “i” to “j” (or from one sector to the other in general) are divided by total outputs “Xi”, we can obtain technical coefficients that reflect the cost structure of each industry (Lábaj 2014). The set of equations (1) can be rewritten to  $X = AX + Y$  (2) and transformed to  $X = (I - A)^{-1} Y$  (3). The matrix  $(I - A)^{-1} = L$  (Leontief inverse matrix) helps to understand what are the total direct and indirect effects of any increase in the final demand for production in each sector. It represents the base for the IO analysis.

When sector “i” increases its production, it will generate additional demands for production in all supplying sectors (demand or backward linkage). The higher production in “i” would also mean higher volumes of products that can be used as inputs in other sectors and possibly stimulate their productions (supply or forward linkages) (Reis and Rua 2009, Miller and Blair 2009, Timmer 2012). Logically, these linkages can vary from one sector to other or from country to other. What is more, even though there may be some similar sector characteristics that would apply in general, same sectors will not necessarily show the same traits in various countries. When we transform input output multipliers by normalisation, these values (linkages) can be used as means for measuring the strength of demand (BL) and supply (FL) linkages and for determining the importance of a particular sector. They also enable to verify whether some sectors have more than average impact on the economic activity in other sectors and can be considered as the key ones (Reis and Rua 2006, McLennan 1995, Wixted *et al.* 2006, Trinh *et al.* 2009). The distribution of impacts on other industries can be studied with the help of variation coefficients (VK), a relatively common measure of dispersion of effects on the whole economy. Variation coefficient shows for each industry or sector how it impacts other sectors, *i.e.* whether its effects are evenly distributed (associated with lower values of coefficients VK) or they are rather concentrated on smaller number of other industries (associated with higher values of coefficients VK) (Reis and Rua 2009, Timmer 2012).

Nowadays, productions in various countries are interlinked and production processes are fragmented. That is why it is important to take into consideration the volume of imports that are generated by domestic production (volume of the imported inputs due to the increased domestic demand) as well as the volume of exports transported abroad.

## 3. Results and Discussion

With regards to the limited extent of this paper, we decided to analyse the evolution of Agriculture and Food production – sectors noted A01 and C10-12 according to the International Industrial Classification, revision 4 (ISIC Rev.4). We used data from the WIOD Database covering the period 2000-2014 (WIOD 2018, UN 2017). The choice of sectors can be linked to the certain trend of decline of domestic production in these sectors even though they can still be considered as basic ones in each economy. We would like to verify their current positions, similarities in their evolution and to compare possible changes in their positions for the period 2000-2014. We suppose that



these sectors would present similar characteristics for “older” EU members when compared to each other. On the other hand, results for Slovakia (“new” member country) are expected to differ.

As mentioned before, the importance or the position of any sector can be described by basic indicators, such as the sector’s share on total output, on overall employment, on total value added, on total exports or on total imports. When we compare the characteristics of four selected countries, *i.e.* Slovakia, Austria, Germany and France, out of the 56 sectors, there are only few sectors with average sector shares exceeding 5% of total values for the whole economy. It was confirmed for all of our observed indicators, *i.e.* average production share on total country’s production (SK– 4 sectors, AT– 3 sectors, DE- 2 sectors, FR- 4 sectors), average employment share on total employment (SK– 6 sectors, AT– 7 sectors, DE- 7 sectors, FR- 6 sectors), average export share on total exports (SK– 5 sectors, AT– 5 sectors, DE- 5 sectors, FR- 5 sectors), average import share on total imports (SK– 6 sectors, AT– 4 sectors, DE- 5 sectors, FR- 6 sectors) and average value added share on total value added (SK– 5 sectors, AT- 6 sectors, DE- 3 sectors, FR- 5 sectors). The most important producers were the sectors of motor vehicles manufacturing (SK and FR), construction (AT) and real estate activities together with motor vehicles manufacturing (DE); the most important employers were the sectors of education (SK and FR) and human health and social services (AT and DE). As for the exporting and importing sectors, the highest average shares for all four countries were observed in the manufacture of motor vehicles. The highest share of value added on total value added was created in construction (SK and FR) and real estate (AT and DE) sectors. From this point of view we could state that Slovakia and France share some similar traits in the structure of their national economies. The same can be said about Austria and Germany.

In Table 1 we can see selected values for agriculture and food sectors. We compared the values at the beginning and at the end of the observed period as well as the years of crisis. The average shares of agriculture (a01) and food (c1012) sectors were low, not exceeding 5% for the analysed period. The only exception is the Austrian agriculture sector in 2000-2004 that covered slightly more than 5% of the total employment. As for the overall trend in evolution, countries experienced declines in both production and employment shares *vis-à-vis* the overall production and employment. The most significant reductions (more than 50%) appeared in Slovakia in case of c1012 (for production share) and a01 (for employment share). The least significant changes (decreases) could be observed in German agriculture and food sectors where the shares remained fairly stable.

Table 1. Shares of sector output on total economy’s output, shares of sector employment on total economy’s employment

Country	Sector output on total output (%)					Sector employment on total employment (%)				
	2000	2008	2010	2014	Δ %	2000	2008	2010	2014	Δ %
SK a01	3.75	2.51	1.96	2.47	-34.1	4.78	2.61	2.34	2.18	-54.4
AT a01	3.00	2.03	2.29	2.25	-25.0	3.31	1.82	2.20	2.01	-39.3
DE a01	1.05	0.95	0.87	0.89	-15.2	1.74	1.53	1.50	1.42	-18.4
FR a01	2.52	2.03	2.03	2.10	-16.7	3.43	2.76	2.67	2.62	-23.6
SK c1012	4.49	2.62	2.26	2.22	-50.7	3.51	2.54	2.42	2.14	-39.0
AT c1012	5.58	4.12	4.18	4.20	-24.7	4.13	3.25	2.36	2.89	-30.0
DE c1012	3.51	3.42	3.33	3.48	-0.85	2.32	2.26	2.25	2.17	-6.47
FR c1012	4.65	4.24	3.99	4.11	-11.61	2.50	2.33	2.30	2.31	-7.60

Source: Prepared by author, WIOD.

Table 2 compares the average values of sectors’ exports and imports on total exports and imports. It can be seen that the values are lower for agriculture exports with an increasing trend. The food production exports recorded a slight decrease in average shares in case of Slovakia and increases for Austria, Germany and France. On the other hand, agriculture imports showed mainly decreasing trends, with the exception of imported food products in Austria, Germany and France that augmented by almost 9% (FR), 12% (AT) and 23% (DE) between 2000- 2014.

However, when compared to the average shares of exports and imports of other sectors, agriculture and food sectors’ shares could be considered as almost negligible, with relatively low values. *E.g.* in case of motor vehicles manufacturing, exports accounted on average for about 22% of exports and 19.5% of imports in Slovakia. This sector was the biggest exporter and importer also in Austria and Germany with average shares of 10% for exports and almost 9% for imports (AT) and 16.6% for exports and 11.6% for imports (DE). The structure of French foreign trade was similar to other studied countries on the export side, *i.e.* 10 % of exports ensured by motor vehicles manufacturing. On the import side, however, the sector of manufacture of coke and refined petroleum products is the most significant one (9.3%).



This comparison confirms similar economic structures of studied countries from the point of view of exports and imports, especially for Slovakia, Austria and Germany. In this case France foreign trade shows comparable results mainly on the export side.

Table 2. Shares of sector exports and imports on total country's exports and imports

Country	Sector export on total export (%)					Sector import on total import (%)				
	2000	2008	2010	2014	Δ %	2000	2008	2010	2014	Δ %
SK a01	0.92	1.54	1.53	1.55	+68.48	3.18	1.51	1.55	1.91	-39.94
AT a01	0.67	0.71	0.78	0.77	+14.92	1.29	1.10	1.12	1.10	-14.73
DE a01	0.62	0.61	0.73	0.76	+22.58	1.06	0.97	0.98	1.02	-3.77
FR a01	2.29	2.36	2.56	2.43	+6.11	2.65	2.56	2.27	2.53	-4.53
SK c1012	1.49	1.63	1.51	1.03	-30.87	3.59	2.11	1.96	1.90	-47.08
AT c1012	3.64	4.66	5.43	5.74	+57.69	3.32	3.35	3.34	3.71	+11.75
DE c1012	3.22	3.68	4.16	4.52	+40.37	4.31	4.30	4.51	4.63	+23.20
FR c1012	5.50	5.63	5.68	6.03	+9.64	3.47	3.58	3.64	3.77	+8.65

Source: Prepared by author, WIOD.

Table 3 shows average shares of value added on total value added. Here again, we can state that none of the observed sectors exceeded 5% average share and were mostly below 3% share. What is more, shares of value added for agriculture and food sectors decreased over this period. The highest decline appeared in case of Slovak food sector (about -50%), the lowest was recorded in Slovak agriculture (-7.54%). As for all other sectors in Slovakia, Austria, Germany and France, the highest shares of value added were identically recorded in construction and real estate sectors. From this point of view, countries could be again considered as similar.

When we compare the period of crisis in all previous tables, we can conclude that the effects of crisis were rather mixed. The average shares of production, employment, export, import and value added on the total countries' value suggest in some cases a slight decline around 2000-2009 with a subsequent recovery after 2010 or a continuing decline in others.

Table 3. Shares of sector value added on total country's value added

Country	Sector value added on total value added (%)				
	2000	2008	2010	2014	Δ %
SK a01	3.58	3.20	2.07	3.31	-7.54
AT a01	1.40	1.11	1.02	0.98	-30.00
DE a01	0.96	0.78	0.64	0.60	-37.50
FR a01	2.14	1.51	1.63	1.52	-28.97
SK c1012	2.94	1.83	1.60	1.47	-50.00
AT c1012	2.08	1.81	1.95	1.87	-10.10
DE c1012	1.91	1.59	1.65	1.62	-15.18
FR c1012	2.73	2.27	2.10	2.23	-18.32

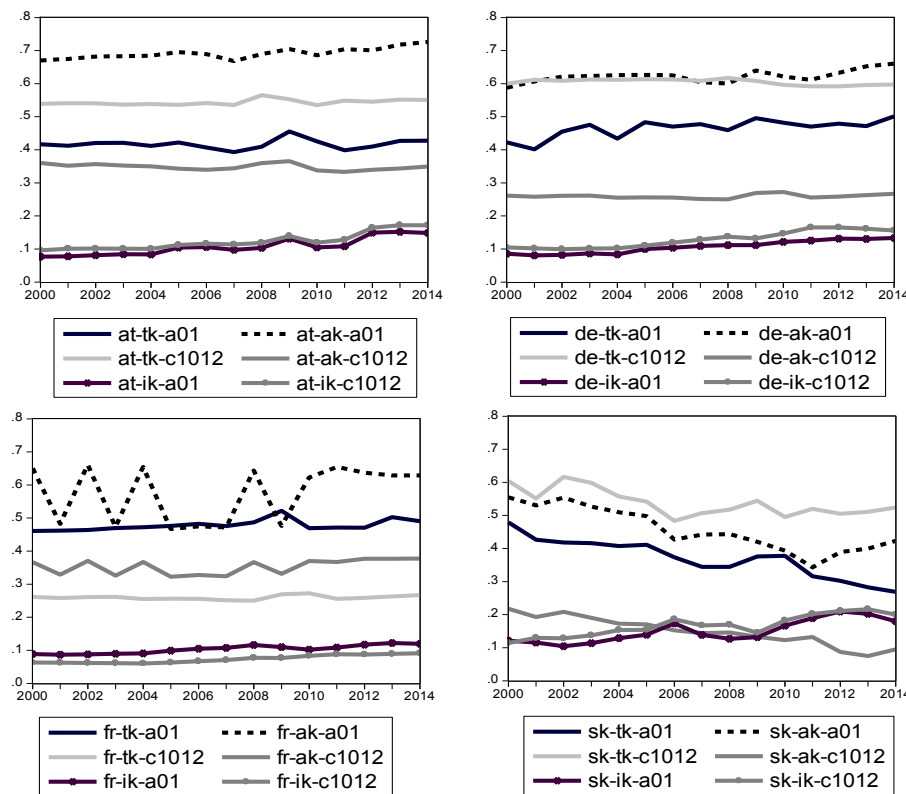
Source: Prepared by author, WIOD.

The next step consisted of the analysis using input output tables with data representing intersectorial relationships within each economy. Firstly, we looked closely at the coefficients that represent intermediate production: technical coefficients (tk, for output), allocation coefficients (ak, for input) and import coefficients (ik, for import). The coefficients were used to calculate simple output, input and import multipliers (som, sim, simp). And lastly, we proceeded to verify the importance of sectors by analysing the strength of demand and supply linkages (BL, FL).

In order to calculate multipliers, we firstly had to look more closely on basic IO coefficients (Figure 1). Technical and allocation coefficients were marked by steady declines (mainly SK). In Austria, Germany and France, these coefficients remained fairly stable, the increases were almost negligible. On the other hand, import coefficients were showing the opposite trend, *i.e.* a gradual increase in values, confirming growing significance of the imported inputs for both sectors and all observed countries. It can be also interpreted as an increasing share of domestic inputs that are being replaced by the imported ones. This is especially visible in case of Slovakia.

As for the particular values, import coefficients were rather similar, mainly around the value 0.10 (AT, DE, FR) and almost at the value 0.2 (SK). Similar values for three "old" members appear also for technical coefficients (a01) and allocation coefficients (c1012). This again points to different results and situation for "old" and "new" EU members.

Figure 1. Technical, allocation, import coefficients – sectors a01, c1012 (SK, FR, DE, AT, period 2000-2014)



Source: Prepared by author, WIOD

Table 4 shows the minimum and maximum values of three multipliers as well as their average and median values. The results in Table 4 tell that higher average demand impacts (som) appear in case of food production. Each demand increase of 1€ in food sector should generate 1.93€ (SK), 1.94€ (AT), 2.08 € (DE) or even 2.19€ (FR) of additional productions in supplying sectors. The highest supply impact (sim average) means that 1€ of agricultural production could generate 2.12€ in Austria or 2.16€ in France of new production when looking forward. As for import multipliers (simp), these values are usually lower than som and sim. Here the average values range from 0.16 (French food sector) to 0.32 (Austrian food sector) meaning that for 1€ increase in demand, new imports of about 0.16 - 0.32€ would be needed.

Table 4. Output, input and import multipliers

Country	Som min	Som max	Som av	Som med	Sim min	Sim max	Sim av	Sim med	Simp min	Simp max	Simp av	Simp med
SK a01	1.40	1.90	1.62	1.61	1.47	2.11	1.68	1.62	0.18	0.31	0.24	0.23
AT a01	1.67	1.82	1.71	1.71	2.06	2.19	2.12	2.11	0.13	0.26	0.18	0.18
DE a01	1.70	1.86	1.80	1.81	1.82	1.92	1.87	1.87	0.14	0.25	0.19	0.20
FR a01	1.86	2.01	1.90	1.88	1.97	2.50	2.16	2.10	0.16	0.23	0.20	0.20
SK c1012	1.79	2.19	1.93	1.87	1.11	1.69	1.24	1.19	0.25	0.39	0.32	0.31
AT c1012	1.91	1.99	1.94	1.94	1.47	1.53	1.49	1.49	0.18	0.33	0.24	0.22
DE c1012	2.06	2.11	2.08	2.08	1.33	1.36	1.34	1.34	0.21	0.34	0.27	0.27
FR c1012	2.15	2.23	2.19	2.19	1.57	1.86	1.66	1.60	0.13	0.20	0.16	0.16

Source: Prepared by author, WIOD

When compared, values of average and median can be used for a simple evaluation of the stability of these sectors. Closer values of average and median could be interpreted as a higher stability of multipliers. Values that are more far apart would thus mean a higher fluctuation or presence of a certain trend in the evolution of multipliers. Table 4 shows that these values are mostly identical or very close to each other. Slightly higher differences can be observed in case of SK c1012 (som, sim) and FR a01 (sim).

From the point of view of IOT analysis, we can see similar average results for agriculture in Slovakia and Austria (som – a01, c1012), France and Austria (sim - a01) or Germany and Austria (simp – a01, c1012). As a result, it is possible to conclude that these sectors do have some similar traits but only to a limited extent. In general, these similarities appear mainly in the group of “old” members

The next step consisted of the analysis of the normalised values of output and input multipliers (som and sim) or demand and supply linkages as they are also referred to. Table 5 (left part) shows the average values for normalised backward (nBL) and forward (nFL) linkages in case of studied sectors of agriculture and food production. Values of nBLs and nFLs higher than 1 indicate the orientation of the sector either backward or forward (strong demand or supply linkage). If both linkages exceed 1, this sector can be considered as a key sector to the economy.

From the results presented in Table 5, agriculture can be on average considered as key in Austria (1.06 and 1.24), in Germany (1.07 and 1.08) and also in France (1.10 and 1.18). On the other hand, food sector in these three countries is only backward oriented (nBL>1 and nFL<1). More detailed analysis confirms that the agriculture could have been qualified as key also in Slovakia but only at the beginning of the observed period, notably over 2000–2005. For Slovak food production we can again observe stronger demand orientation. This points out to the probable linkage between agriculture and food production, where the agriculture serves as a supplier of inputs to the food sector. Comparison of values by individual countries shows higher similarity for “old” EU members.

Table 5. nBL and nFL, VK

Country	nBL	nBL	nFL	nFL	Total	VK	min	max	av
	av	VK 0%	Av	VK %					
SK a01	0.98	4.41	0.99	6.12	SK	nBL	1.33 (C23)	23.07 (R-S)	4.86
AT a01	1.17	2.46	0.73	8.51		nFL	1.75 (N)	28.65 (G46)	10.14
DE a01	1.06	1.71	1.24	2.03	AT	nBL	0.80 (G47)	10.32 (C19)	2.55
FR a01	1.20	1.01	0.88	1.05		nFL	0.74 (G47)	17.04 (A03)	3.84
SK c1012	1.07	2.40	1.08	2.38	DE	nBL	0.57 (C1012)	11.91 (C19)	2.64
AT c1012	1.24	0.58	0.78	1.31		nFL	0.61 (M71)	23.25 (M72)	2.38
DE c1012	1.10	1.98	1.18	5.36	FR	nBL	0.62 (I)	11.77 (D35)	2.43
FR c1012	1.27	0.87	0.91	3.33		nFL	1.29 (H53)	28.20 (M72)	5.73

Source: Prepared by author, WIOD

Based on demand and supply relationships we can determine the extent of the sector's impact; whether its effects are more or less concentrated on other industries. The influence can be determined thanks to variation coefficient (VK). As mentioned before, higher values of VK indicate a stronger concentration on interconnected industries; lower values refer to lower concentration and evenly dispersed impacts across the economy.

When comparing all sectors in selected countries, we can see some differences (right side of Table 5). Table shows the sectors with the most and the least concentrated average impacts on both demand and supply side in Slovakia, Austria, Germany and France. From this point of view, we cannot affirm that countries have similarly interlinked sectors with similarly distributed concentrations of effects. Countries' average VK for backward or forward linkages are mainly lower, indicating a rather even distribution of various sectors' impacts on national economies. The only exception is 10% value of VK in case of Slovak forward linkages. Comparison of minimum and maximum VK values shows again many differences for these countries.

As for the observed sectors of agriculture and food production, their values of VK are lower than the countries' average VK. The only exception is SK c1012 with VK for FL at the level of 8.51%. This again could point out to a higher level of similarity for “old” EU members and different situation in case of a “new” member. In general, we can conclude that on average, impacts on the demand side are more evenly distributed than on the supply side (VK for nBL > VK for nFL).

Based on these findings it would be interesting to widen this type of analysis and include other “old” EU member such as Italy or Spain on one side and other “new” members on the other – especially other countries from the V4 group, Baltic or Balkan countries. Here again it would be possible to compare the positions and the main

characteristics of agriculture and food sectors. In some of these countries it can be expected that both sectors would still hold an important place in national economies (from the point of view of employment and production) and that they would probably show traits of key sectors with significant impacts on other sectors. However, the exact extent and the similarity of national economic structures need to be verified by detailed analyses.

## Conclusion

The aim of this paper was to present and compare the main characteristics of two selected sectors, namely the sectors of agriculture and food production in case of Slovakia and three chosen “older” EU member countries, i.e. Austria, Germany and France. Analyses compared the shares of sectors on the total output, employment, exports, imports and value added. With the exception of food sector in Austria, neither agriculture nor food sector, exceeded 5% share in total values. While the shares of production, employment, exports and value added were decreasing, the import shares became more important. From the similarity point of view, the calculated shares point to many common traits between structures of national economies in France and Slovakia on one side and Austria and Germany on the other side (production and, employment). However, the foreign trade (exports, imports) points to higher similarity for Slovakia, Austria and Germany.

We compared basic input output coefficients and multipliers for the period of 2000-2014. Here again, the descending trend was fairly visible for technical and allocation coefficients as well as for output and input multipliers of Slovakia and Austria. In Germany and France the values of coefficients and multipliers remained almost at the same level or recorded only slight increases. The results for import (observed increases in simp) confirmed the growing importance of foreign products on domestic markets. The stability of sectors was verified by comparison of average and median values. Higher differences were present only in case of food production confirming a possible trend (downward in Slovakia, upward in Austria, Germany and France).

The analysis enabled the verification of key industries. We expected that in accordance with weakening importance and shares of the sectors, they would not present the characteristics of the key sectors. However, this was not confirmed by the calculations. The analysis showed that the Austrian, German and French agriculture sectors presented at the same time strong backward and forward linkages, meaning they could be marked as key sectors. Slovak agriculture could have been considered as the key sector only at the beginning of the observed period. In case of food productions only stronger demand linkages were confirmed.

Lastly the distribution of impacts was verified via variation coefficients. These coefficients were lower than average countries' VK, meaning that agriculture and food sectors have their impacts much more evenly distributed than are Slovak, Austrian, German and French averages. The impacts on the demand side could be considered as more evenly distributed than on the supply side. This part of analysis could again confirm a higher level of similarity for “old” EU members and different situation in case of a “new” member.

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## The Effect of Special Autonomy Funds on Economic Growth and Income Inequality in Aceh Province

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### Abstract

This study aimed to analyze the impact of Special Autonomy and other funds through capital expenditures and expenditures on goods and services on economic growth and income inequality. This study used the panel data of 2000-2016 in 23 regencies/cities of Aceh Province using *Fixed Effect Model* (FEM) analysis. The results of this study showed that before the Special Autonomy Fund, the Special Allocation Fund (DAK), General Allocation Fund (DAU), Revenue Sharing Fund (DBH), and Local Own-Source Revenue (PAD) have a positive and significant effect on Gross Regional Domestic Product (GRDP) and Gini ratio through capital expenditure, however, the significant and positive effect on GRDP and Gini Ratio through expenditures on goods and services is only found from Local Own-Source Revenue (PAD). After the existence of Special Autonomy Funds, it is only the Special Allocation Fund (DAK) that has a positive and significant effect on GRDP and Gini ratio through capital expenditures, while the significant effect on expenditures on goods and services is found from DAK, DAU and PAD variables. The results showed that the Special Autonomy and Revenue Sharing Funds still do not have significant effect in increasing economic growth and reducing Gini ratio through both capital expenditures and expenditures on goods and services.

**Keywords:** specially allocated funds; special autonomy funds; Gini ratio; economic growth

**JEL Classification:** H72; H77; R11; R56

### Introduction

Since 1974, the Government of Indonesia has adopted a decentralization policy by issuing Law Number 5 of 1974. According to the law, decentralization is the handover of governmental affairs by the central government to autonomous regions based on the Principles of Autonomy. The delegation of authority to the Local Governments solely to achieve an efficient government. The goal of decentralization is to prevent financial centralization; as an effort to democratize the Local Government to involve the people to be responsible for governance and the preparation of programs for socio-economic improvement at the local level so that it can be more realistic. Over time, the Government of Indonesia implemented fiscal decentralization policy through regional autonomy which generally applies to local governments as stipulated in Law Number 32 of 2004, as well as in some packages of Special Autonomy Law No 21 of 2001 for Papua and the Law No 11 of 2006 concerning the Government of Aceh province for regions within the framework of the Unitary State of the Republic of Indonesia. Special Autonomy is a

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special authority recognized and given to the province in order to organize and manage the interests of local people according to their own initiatives based on their aspirations. The term autonomy can be defined as the freedom of the people to organize and manage their own households. The Government of Aceh has many sources of funds that can be used for financing. The sources obtained by the Government of Aceh can be from central government assistance in the form of Special Autonomy Fund, Special Allocation Fund (DAK), General Allocation Fund, and Local Own-Source Revenue that can be used for accelerating the development of Aceh Province. The government of Aceh, with a status as Special Region, receives additional funds in the form of special autonomy funds as stipulated in Law No. 11 of 2006 concerning the Government of Aceh Province.

The special allocation fund is allocated to finance the implementation of special autonomy of a region in the form of the transfer of the Central Government to regions with special autonomy status. The main objective of implementing the transfer of central government to local governments is to reduce fiscal imbalances that occur both vertically and horizontally (Siddik *et al.* 2004). In addition, special autonomy fund aims to encourage the regions with special autonomy status to be able to catch up the development as compared to other regions (Muda and Dharsuky 2015). The special autonomy fund, which is a transfer from the Central Government, can certainly have an effect on the size of the Regional Budget (APBD) of a region to become a significant source of development funding for the provincial and regency/municipal governments in Aceh. Additional transfer of special autonomy funds is granted in line with the enactment of Law no. 11/2006 concerning the Government of Aceh Province. Fund transfers from the Central Government will last for 20 years since the enactment of Law in 2008, of two percent of the National DAU for the first 15 years, and one percent for the last five years in 2023 - 2028. From 2008 to 2016, Aceh has received a special autonomy fund of IDR 49.19 trillion and has been the main source of revenue for Aceh's development, with an average annual revenue increase of 11%. During 20 years of the autonomy, Aceh is expected to receive Rp 163 trillion. This provides a golden opportunity for Aceh to encourage its development in the future.

The economic growth of Aceh Province tends to fluctuate and is unevenly for regencies/cities. The economic growth of Aceh Province for the last six years was 4.75% (2011), 4.84% (2012), 5.25% (2013), 4.19% (2014), 2.89% (2015), 3.06% (2016). The highest mean of PDRBK was reached by Nagan Raya Regency for 5.99%, Banda Aceh City for 5.72%, Aceh Tamiang Regency for 5.54%, West Aceh Regency for 4.79%, and Southeast Aceh Regency for 4.59%. Meanwhile, the lowest PDRB was reached by Lhoksemawe City for 2.80%, Langsa City for 3.30%, North Aceh Regency for 3.52%, Pidie Jaya Regency for 3.65%, and Pidie Regency for 3.66%. The Gini index of Aceh Province in 2011-2016 showed that it is generally decreasing from 0.34 to 0.32. However, from year to year, it showed changes in term of income inequality in 2011-2013 which decreased from 0.34 to 33. In 2013-2014, the Gini index increased from 0.33 to 0.34, and reduced to 0.32 in 2015- 2016. In 2016, the highest Gini Index was observed in Langsa City and Lhoksemawe City with a value of 0.34, whereas the lowest income inequality was found in Bener Meriah Regency, Southeast Aceh Regency, Southwest Aceh Regency, Gayo Lues Regency and Sabang City with a value of 0.28. The highest income inequality in 2009 was observed in Lhoksemawe City with a Gini Index value of 0.34, while the lowest inequality was observed in Bener Meriah Regency with a Gini Index value of 0.27.

In recent years, some developing countries have begun implementing fiscal decentralization policy. Ismail *et al.* (2004) examined the effect of fiscal decentralization on economic growth in several Muslim countries, namely Indonesia, Kazakhstan, Kyrgyzstan and Malaysia. The analysis showed that fiscal decentralization policy encourages economic growth. It further disclosed that the decentralization of government revenue sources has the impetus to the higher growth compared to the decentralization of government expenditure. Empirically, the results of the study related to the analysis of the relationship of fiscal decentralization with economic development did not have consistent conclusions. Various studies showed a negative relationship, some showed non-significant relationship and some others showed a positive relationship. The results showed the positive effect of fiscal decentralization on economic development include Lin and Liu (2000), Desai *et al.* (2003), Akai *et al.* (2004), Zhang and Zou (1998), Akai and Sakata, (2002), Ismail *et al.* (2004), limi (2005), Huther and Shah (1998), Bjornestad (2009), and Armas *et al.* (2010), Faridhi (2011), Badruddin (2013) and Soejoto *et al.* (2015). Studies that analyze the effect of decentralization on economic growth that showed a negative effect are, among others, Zhang and Zou (1998), Davoodi and Zou (1998), while other studies show insignificant influences Wolter and Phillips (1998), Rodríguez-Pose and Ezcurra (2010), Xie *et al.* (1999), Adefeso (2015).

Furthermore, some authors argued that decentralization through autonomy leads to the optimization of public services and efforts to promote economic growth. In addition, they argue that there are some effects of fiscal decentralization associated with regional competition and redistribution from the central government. Lessman (2006) found poor countries are less able to compete in terms of fiscal mobilization compared to rich countries,

therefore, without getting assistance, poor countries would remain poor. Lessman in his research proved the effect of fiscal decentralization on regional gaps using panel data for 17 developing countries from 1980-2001. The results showed that the high level of fiscal decentralization indicates lower regional differences. The motivation of this study is to review the research conducted by Zulham (2015), Faradisi (2015), Murdiansyah and Ikhsan (2017), on special autonomy funds in Aceh Province, and research on the effect of fiscal decentralization in regions and other countries, such as, Syriac (2015) Darwanto and Yustikasari (2007), Putro (2011) and Faridhi (2011) and to find out whether the Special Autonomy Fund, DAK, DAU, PAD, and DBH have positive effect on the allocation of capital expenditures and expenditures on goods and services on economic growth. Another reason is that the allocation of capital expenditures for each region is not in line with what is expected by the local government because the local governments should be able to allocate capital expenditure budget well because capital expenditure is one of the steps for local government in improving public services.

## 1. Literature Review

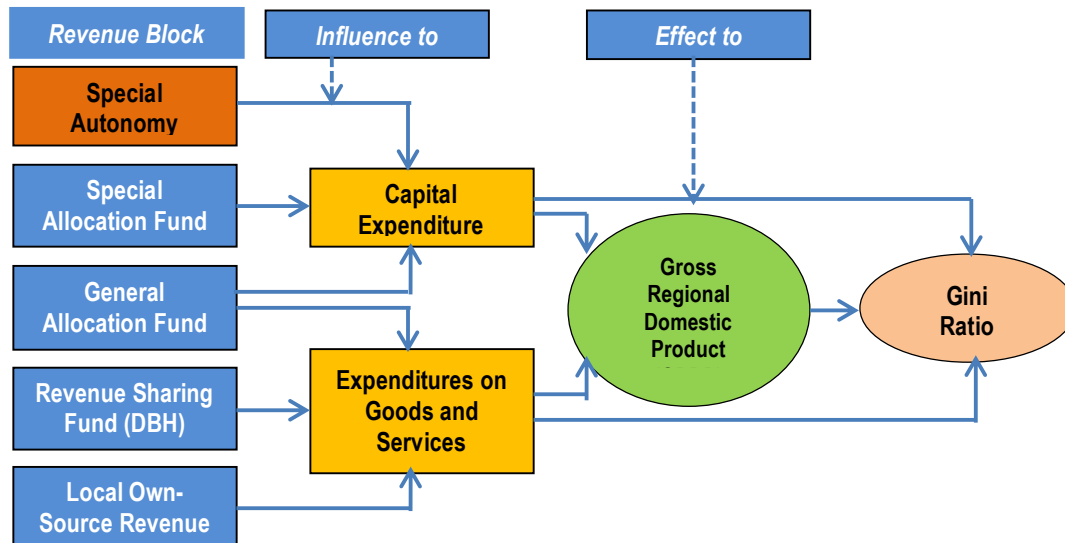
There have been many countries in the world implementing some policies in order to improve the distribution of income, among others, fiscal decentralization policy. Sepulveda *et al.* (2011) conducted a study on the effect of fiscal decentralization on economic growth and income inequality. The sample consisted of 34 developing countries in Africa in the period of 1976 - 2000. The results showed that fiscal decentralization has a significant effect on economic growth and reducing income inequality. Researchers focused their research on the determining factors of public sector growth seen from the effect of fiscal decentralization. Brothaler and Getzner (2010) reviewed the contribution of fiscal decentralization to economic growth in Austria. The sample consisted of Provinces in Austria from 1955-2007. The results showed that the increase in GDP will increase the government expenditures and also reduce the unemployment rate. The results of cointegration test showed that fiscal decentralization significantly encourages both short-term and long-term economic growths. The study conducted by Faridi (2011) in Pakistan, by using the time period of 1972-2009, found that the fiscal decentralization of expenditure and income method autonomously had significant and positive effect on economic growth and reducing income inequality. Based on these results, Faridi recommended the federal government to delegate fiscal power to provincial and district governments to improve the growth and welfare of the people of Pakistan. Bahl and Wallace (2006) examined the effect of fiscal decentralization on equity in Russia. The sample consisted of 21 regions in Russia in 1997. The Local governments use mixed fiscal instruments to balance spending for regional autonomy that requires larger budgets to the regions and help to eliminate inequality between regions (Sihombing *et al.* 2017). In addition, Bahl and Wallace (2006) also developed methods to study the tradeoff between decentralization and equity. In essence, that without having priority and detailed understanding of institutional arrangements and relationships among local governments, the implication of equity and decentralization cannot function optimally. There have been many countries in the world implementing fiscal decentralization policy with the aim of increasing regional economic growth and reducing inequality between regions. Sepulvade *et al.* (2011) conducted a study in Africa by using 34 developing countries as the sample in the period of 1976-2000. The results of the study showed that fiscal decentralization significantly reduces regional inequality and improve the economic growth of regions.

## Conceptual Framework

The conceptual framework is found in the following Figure 1 as a follows below.

From Figure 1, this study analyzed income block that consists of Special Autonomy Fund, DAK, DAU, DBH and PAD that have some effect on expenditure block through Capital Expenditure and Expenditure on Goods and Services which have some effect on PDRBK and Gini ratio. This study focused on the realization of the Special Autonomy and other funds such as DAK, DAU, DBH and PAD and capital expenditures and expenditures on goods and services, economic growth and Gini ratios of regencies and cities in Aceh Province following the grant of special autonomy fund.

Figure 1. Research Framework



## 2. Methodology

This study was conducted in Aceh Province to analyze the effect of capital expenditures and expenditures on goods and services in mediating the relationship between Special Autonomy Fund, DAK, DAU, DBH, PAD on economic growth as measured by using Gross Regional Domestic Product (GRDP). The secondary data on these variables come from 23 local governments in Aceh Province in the period of 2000-2016. The method used was Ordinary Least Square (OLS) with Fixed Effect Model (FEM) model which refers to the model built by Juanda *et al.* (2017). Natural logarithm (LN) transformation was performed on either independent or dependent variables to facilitate model interpretation. The transformation was also to reduce significant differences between the great and small value observations and to make the data normally distributed. The regression models in this study include the followings:

I. The model of the effect of independent variables on capital expenditure and expenditure on goods and services variables.

a. The model of the effect of the transferred fund on capital expenditure variable:

$$\text{LNBM}_{it} = \beta_0 + \beta_1 \text{LNDAK}_{it} + \beta_2 \text{LNDAU}_{it} + \beta_3 \text{LNPA}_{it} + \beta_4 \text{DBH}_{it} + \beta_5 \text{LNOTSUS}_{it} + \text{DOK} + \beta_6 \text{LNDAK}_{it} * \text{DOK} + \beta_7 \text{LNDAU}_{it} * \text{DOK} + \beta_8 \text{LNPA}_{it} * \text{DOK} + \beta_9 \text{DBH}_{it} * \text{DOK} + \beta_{10} \text{LNDBH}_{it} * \text{DOK} + \varepsilon_{it} \quad (1)$$

b. The model of the effect of the transferred fund on expenditure on goods and services variable:

$$\text{LNBBJ}_{it} = \beta_0 + \beta_1 \text{LNDAK}_{it} + \beta_2 \text{LNDAU}_{it} + \beta_3 \text{LNPA}_{it} + \beta_4 \text{DBH}_{it} + \beta_5 \text{LNOTSUS}_{it} + \text{DOK} + \beta_6 \text{LNDAK}_{it} * \text{DOK} + \beta_7 \text{LNDAU}_{it} * \text{DOK} + \beta_8 \text{LNPA}_{it} * \text{DOK} + \beta_9 \text{DBH}_{it} * \text{DOK} + \beta_{10} \text{LNDBH}_{it} * \text{DOK} + \varepsilon_{it} \quad (2)$$

II. The model of the effect of expenditure on goods and services variable on PDRBK, Gini Ratio.

$$\text{LNPRBK}_{it} = \beta_0 + \beta_1 \text{LNBM}_{it} + \beta_2 \text{LNBBJ}_{it} + \beta_3 \text{LNPMTB}_{it} + \beta_4 \text{LNTKERJA}_{it} + \beta_5 \text{DOK} + \beta_6 \text{LNBM}_{it} * \text{DOK} + \beta_7 \text{LNBBJ}_{it} * \text{DOK} + \varepsilon_{it} \quad (3)$$

$$\text{LNGINIRASIO}_{it} = \beta_0 + \beta_1 \text{LNBM}_{it} + \beta_2 \text{LNBBJ}_{it} + \beta_3 \text{LNPRBK}_{it} + \beta_4 \text{DOK} + \beta_5 \text{LNBM}_{it} * \text{DOK} + \beta_6 \text{LNBBJ}_{it} * \text{DOK} + \beta_7 \text{LNPRBK}_{it} * \text{DOK} + \varepsilon_{it} \quad (4)$$

where:  $\text{OTSUS}_{it}$  = Special Autonomy Fund of i-th regency/city of t-th year (Million Rupiah);  $\text{DAK}_{it}$  = Special Allocation Fund of i-th regency/city of t-th year (Million Rupiah);  $\text{DAU}_{it}$  = General Allocation Fund of i-th regency/city of t-th year (Million Rupiah);  $\text{DBH}_{it}$  = Revenue Sharing Fund of i-th regency/city of t-th year (Million Rupiah);  $\text{PAD}_{it}$  = Local Own-Source Revenue of i-th regency/city of t-th year (Million Rupiah);  $\text{BM}_{it}$  = Capital Expenditure of i-th regency/city of t-th year (Million Rupiah);  $\text{BBJ}_{it}$  = Expenditure on Goods and Services of i-th regency/city of t-th year (Million Rupiah);  $\text{PDRBK}_{it}$  = Natural Logarithm of GRDP of i-th regency/city of t-th year (Million Rupiah);  $\text{GINI}_{it}$  = Gini Coefficient of i-th regency/city of t-th year;  $\text{TPT}_{it}$  =

Open Unemployment Rate of *i*-th regency/city of *t*-th year (Percent);  $PMTB_{it}$  = Gross Fixed Capital Formation of *i*-th regency/city of *t*-th year (Million Rupiah); DOK = Dummy Special Autonomy Policy,  $D=0$  (for the period of 2000-2007) and  $D=1$  (2008-2016).

The independent variables in this study were Special Autonomy Fund, DAU, DAK, DBH, and PAD. While the dependent variable was economic growth which was proxied to GRDP and Gini ratio values, the intervening variables used were capital expenditure and expenditure on goods and services.

### 3. Result and Discussion

#### 3.1. Result

The economic growth of Aceh Province in the last five years was 4.75% (2011), 4.84% (2012), 5.25% (2013), 4.19% (2014), 2.89% (2015), 3.06% (2016). The highest PDRBK was achieved by Nagan Raya Regency for 5.99%, Banda Aceh City for 5.72%, Aceh Tamiang Regency for 5.54%, West Aceh Regency for 4.79%, and Southeast Aceh Regency for 4.59%. Meanwhile, the lowest PDRB was reached by Lhoksemawe City for 2.80%, Langsa City for 3.30%, North Aceh Regency for 3.52%, Pidie Jaya Regency for 3.65%, and Pidie Regency for 3.66%. The distribution of the special autonomy funds is determined by the formulation, in which the regions that receive the largest average of the funds are East Aceh Regency, Gayo Lues Regency, and Southeast Aceh Regency. While the regions which received the smallest funds are Sabang City, Lhoksemawe City and Langsa City. The Local Own-Source Revenue (PAD) of regency/city in Aceh Province has a positive growth rate of above 13%. The highest PAD was obtained by Aceh Utara Regency, Banda Aceh City, Pidie Regency, Bireuen Regency, and Central Aceh Regency. The amount of DAU since 2010-2016 has increased. North Aceh Regency received the largest DAU while Subulussalam Regency received the smallest DAU. Central Aceh Regency received the largest DAK in 2016, while Nagan Raya Regency received the smallest DAK. North Aceh Regency received the largest DBH in 2016, considering that North Aceh Regency is one of the oil producing regencies in Aceh Province, while Subulussalam City, Southwest Aceh Regency and Pidie Jaya Regency received the smallest DBH. North Aceh Utara and Central Aceh Regencies are the regions with the highest average of capital expenditure. Meanwhile, Sabang City, Simeuleu Regency, Langsa City, and Subulussalam City are the regions with the lowest average of capital expenditure. North Aceh Regency, Banda City, and East Aceh Regency are the regions with the highest average of expenditure on goods and services. Meanwhile, Subulussalam City, Aceh Jaya Regency, Langsa City, and Bener Meriah Regency are the regions with the lowest average of expenditure on goods and services.

#### 3.1.1. The effect of Special Autonomy Fund, DAK, DAU, DBH, PAD on Capital Expenditure and Expenditure on Goods and Services

The statistical results showed in the Table 1 the direct effect of Special Autonomy Fund, DAK, DAU, DBH, and PAD on Capital Expenditure in 23 regencies and cities in Aceh Province from 2000 to 2016.

Table 1. The effect of transferred funds on capital expenditure and on goods and services

Independent Variables	Dependent Variables			
	LN BM	P Value	LN BBJ	P Value
Constant	4.289	0.0003	8.523	0.0000
LN_DAK	0.194	0.0000	0.024	0.2531
LN_DAU	0.332	0.0078	0.167	0.0111
LN_DBH	0.073	0.1154	0.023	0.3166
LN_PAD	0.073	0.0000	0.003	0.6741
LN_OT SUS	0.072	0.5953	0.017	0.7915
DOK	-3.549	0.0772	-4.879	0.0000
LN_DAK*DOK	0.294	0.0002	0.139	0.0006
LN_DAU*DOK	0.007	0.9691	0.318	0.0018
LN_DBH*DOK	-0.145	0.0242	-0.25	0.0000
LN_PAD*DOK	0.049	0.4618	0.207	0.0000
Observations	391		391	
R-square	0.834		0.874	

Source: Eviews Result Test (2018)

Based on the Table 1 the model which used Fixed Effect Model can be explained using the following equations of the effect of transferred funds with capital expenditure before the Special Autonomy Funds:



$$LN\_BMODAL_{it} = 4.289 + 0.194 LN\_DAK_{it} + 0.332 LN\_DAU_{it} + 0.073 LN\_DBH_{it} + 0.073 LN\_PAD_{it} + e_{it}$$

The Equation of the effect of transferred funds with capital expenditure after the Special Autonomy Funds

$$LN\_BMODAL_{it} = 0.740 + 0.488LN\_DAK_{it} + 0.339LN\_DAU_{it} - 0.073 LN\_DBH_{it} + 0.122 LN\_PAD_{it} + 0.072 LN\_OTSUS_{it} + e_{it}$$

The Equation of the effect of transferred funds with expenditure on goods services before the Special Autonomy Funds

$$LN\_BBJ_{it} = 8.523 + 0.024 LN\_DAK_{it} + 0.167 LN\_DAU_{it} + 0.023 LN\_DBH_{it} + 0.003 LN\_PAD_{it} + e_{it}$$

The Equation of the effect of transferred funds with expenditure on goods services before the Special Autonomy Funds:

$$LN\_BBJ_{it} = 0.3643 + 0.164LN\_DAK_{it} + 0.485LN\_DAU_{it} - 0.232 LN\_DBH_{it} + 0.210 LN\_PAD_{it} + 0.016 LN\_OTSUS_{it} + e_{it}$$

The results of Table 1 explain the differences in the effect of capital expenditure before and after the special autonomy fund, especially for the Special Allocation Fund (DAK). It can be seen from the interaction results after the Special Autonomy Fund that DAK has an elasticity value of 0.488% which means that it increases by 0.294 compared to which before the Special Autonomy Fund. These results are consistent with previous research conducted by Darwanto and Yustikasari (2007), Putro (2011), Hamdani (2012) and Surakarta (2015) and Juanda (2017), showed that DAU has positive and significant effect on the allocation of capital expenditure. Meanwhile, the effect of Profit Sharing Revenue (DBH) on capital expenditure has decreased compared to which before the special autonomy fund, it is because the DBH growth is negative after the special autonomy fund. The special autonomy fund has no significant effect on capital expenditure. The contribution of PAD increased after the special autonomy fund on capital expenditure to 0.122%. PAD has a significant effect on capital expenditure, however, before the special autonomy fund, PAD has no significant effect, ceteris paribus. Based on the value of R2 = 0.834, it can be concluded that this model can explain the diversity of dependent variable by 83.4%.

The effect of Special Autonomy Fund, DAK, DAU, DBH, and PAD on the allocation of expenditure on goods and services, as seen from Table 1, is shown that before the Special Autonomy Fund, DAU variable has significant effect on the expenditure on goods and services, while DAK, DBH and PAD variables cannot explain the significant effect on expenditure on goods and services. From the data, it can be seen that every 1% increase in DAU will increase the expenditure on goods and services by 0.17%, ceteris paribus. After the Special Autonomy Fund, the increase in DAU, DAK and PAD has significant affect on the expenditure on goods and services, while the autonomy fund does not have any effect on the expenditure on goods and services. The results show that DAU variable has the greatest effect on the increase of expenditure on goods and services after the Special Autonomy Fund where every 1% increase in DAU will increase the expenditure on goods and services by 0.31%, while every 1% increase in PAD will increase the expenditure on goods and services by 0.21% and every 1% increase in DAK will increase the expenditure on goods and services by 0.16%, ceteris paribus.

### 3.1.2. The allocation of expenditure on goods and services on the growth of PDRBK and Gini ratio

From the data, it can be seen that every 1% increase in capital expenditure will increase PDRBK growth by 0.082% if other independent variables are considered constant. This is illustrated in the following Table 2 as follows:

Table 2. The effect of expenditure on goods and services on PDRBK

Independent Variable	Dependent Variable	
	LN_PDRBK	P_Value
CONSTANTA	7.677	0.000
LN_BMODAL	0.082	0.000
LN_BBARANGJASA	0.002	0.866
LN_PMTB	0.133	0.000
LN_TKERJA	0.302	0.000
DOK	-0.944	0.000
LN_BMODAL*DOK	0.049	0.000



Independent Variable	Dependent Variable	
	LN_PDRBK	P_Value
LN_BBARANGJASA*DOK	0.036	0.002
Observations	391	
R-square	0.991	

Source: Eviews Result Test (2018)

The equation of the effect of capital expenditure and expenditure on goods and services on PDRBK before the Special Autonomy Fund

$$LN\_PDRBK_{it} = 7.677 + 0.082LN\_BMODAL_{it} + 0.002LN\_BBARANGJASA_{it} + 0.133LN\_PMTB_{it} + 0.302LN\_TKERJA_{it} + e_{ij}$$

The equation of the effect of capital expenditure and expenditure on goods and services on PDRBK after the Special Autonomy Fund

$$LN\_PDRBK_{it} = 6.733 + 0.131LN\_BMODAL_{it} + 0.038LN\_BBARANGJASA_{it} + 0.133LN\_PMTB_{it} + 0.302LN\_TKERJA_{it} + e_{ij}$$

Following the special autonomy fund, the allocation of capital expenditure and expenditure on goods and services have significant increase on the growth of PDRBK. It shows that capital expenditure has the greatest effect on PDRBK growth where every 1% increase in capital expenditure will increase the growth of PDRBK by 0.13%, means that the effect of capital expenditure increases by 5% from the time before the Special Autonomy Fund, then, the expenditure on goods and services has significant on PDRBK where every 1% increase in the expenditure on goods and services will increase the PDRBK by 0.038% if other independent variables are considered constant, means that the expenditure on goods and services increases by 3.6% from the time before the Special Autonomy Fund. This is similar to what has been conducted by Faradisi (2015), that based on the result of panel data regression by using *fixed effect model*, it is explained that DAU and PAD have significant effect on the economic growth of Aceh Province in 2008-2011, while the Special Autonomy Fund has no significant effect on the economic growth.

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### 3.1.3. The Effect of Expenditure on Goods and Services and PDRBK on Gini Ratio before Special Autonomy Fund

Table 3 shows the capital expenditure, expenditure on goods and services, and PDRBK growth have significant effect on the equation of the effect of expenditure on goods and services and PDRBK on Gini Ratio before the Special Autonomy Fund:

$$LN_{GINIRATIO} = -0.820 - 0.009LN\_BMODAL_{it} - 0.008LN\_BBARANGJASA_{it} - 0.008LN\_PDRBK_{it} + e_{it}$$

The equation of the effect of expenditure on goods and services and PDRBK on Gini Ratio after the Special Autonomy Fund:

$$LN\_GINIRATI = -0.646 - 0.016LN\_BMODAL_{it} - 0.013LN\_BBARANGJASA_{it} - 0.011LN\_PDRBK_{it} + e_{it}$$

Table 3. The effect of expenditure on goods and services on Gini ratio

Independent Variable	Dependent Variable	
	LN_GINI RATIO	P Value
CONSTANT	-0.820	0.000
LN_BM	-0.009	0.0000
LN_BBJ	-0.008	0.0000
LN_PDRBK	-0.007	0.0752
DOK	0.174	0.0000
LN_BM*DOK	-0.007	0.0007
LN_BBJ*DOK	-0.005	0.0068
LN_PDRBK	-0.003	0.0116
Observations	391	
R-square	0.895	

Source: Eviews Result Test (2018)

From Table 3, it can be seen that the effect of allocation of capital expenditure, expenditure on goods and services and growth of PDRBK on the effect of independent variables on gini ratio, both after and before the Special Autonomy Fund, have significant effect on gini ratio. Capital expenditure is the variable with the greatest effect on the decrease of gini ratio where every 1% increase of capital expenditure allocation, before the Special Autonomy Fund, can decrease the gini ratio by 0.09%, while after the Special Autonomy Fund, every 1% increase of capital expenditure will decrease the gini ratio by -0.016%, means that it increases by 0.007%. The similar effect is also found from the allocation of expenditure on goods and services after the Special Autonomy Fund, where every 1% increase of expenditure on goods and services will decrease the gini ratio by -0.068%. PDRBK growth also has an effect on the decrease in gini ratio where every 1% increase in PDRBK growth after the Special Autonomy Fund will decrease the gini ratio by -0.003%, *ceteris paribus*. This is in line with the Kuznet's hypothesis which states that at the beginning of the development process there will be an increase in income which is overshadowed by an increase in income inequality. However, in the long term period, income inequality tends to decrease due to the *spillover* of development results. As seen from the above equation, then the development process in Aceh Province has reached the long-term stage because the increasing income per capita decreases income inequality. These results are similar to the results of the research conducted by Sepulveda and Vazquez (2011), which examined 34 developing countries that implement a fiscal decentralization system, stating that fiscal decentralization has a significant effect on decreasing income inequality.

### 3.2. Discussion

This result is also in line with the results of the research conducted by Feld *et al.* (2010) that regional autonomy can improve the satisfaction of fulfillment of people's needs, prevent business relocation and discharge of sources of income, reduce fiscal pressure, and, ultimately, drive the economic growth and reduce the income inequality. Nurhemi and Suryani (2015) state that regional financial autonomy with national Fiscal Decentralization in Indonesia has a positive and significant effect on economic growth after fiscal decentralization. This means that self-sufficiency in fiscal spending will encourage economic growth in the province. This condition, according to Wagner's Law, is that in an economy where per capita income increases, the government spending is also increasing relatively, which in turn will increase economic growth. For example, of each region, the positive effect of per capita income growth was only observed in Java and Bali and was applicable in long-term observation periods (1990-2011).

According to (Freinkman 2010), the measure of the success of fiscal decentralization that reflects the incentive effect at the regional level the most is the income autonomy, or the local government expenditure in its financing expenditures, because the government is closer to the society and knows the wishes of the society so as to improve the welfare of local society. This is in line with the results of the research conducted (Amin 2012) concerning the effect of fiscal decentralization on economic growth. One of the arguments for the effect of fiscal

decentralization is that it differentiates local supply provision according to local preferences and circumstances, thereby increasing the effectiveness and efficiency of economic growth. Furthermore, with the existence of regional autonomy, there are benefits of accountability, income and political autonomy and improvement of the quality of public services. It seems that effective fiscal decentralization should focus on the institutional context of community engagement. Murdiansyah (2017) states that, from five independent variables, there are only two variables, namely PAD and DBH, have a significant effect on economic growth. The effect of economic growth on the dependent variable is significant from all variables. This means that if the regression results show that economic growth is increasing, then unemployment and poverty are also increasing, as opposed to the theory that if the economy grows, unemployment and poverty will decrease. This is in contrast to the results of research conducted by Zulham (2015). Prior to the special autonomy, the exogenous variable that has positive and significant effect on the conditional convergence of regional economic growth in Aceh is the Local Own-Source Revenue (PAD), whereas, the variable with negative and significant effect is the Fiscal Balance Fund (DP). In other words, the Fiscal Balance Fund received by Aceh has not been able to improve its regional economic growth.

## Conclusion and Suggestions

### Conclusion

The DAK, DAU, and PAD on capital expenditure before the Special Autonomy Fund have shown positive and significant effect, but after the Special Autonomy Fund, it is only DAK that has significant effect on the increase of capital expenditure. Meanwhile, before the Special Autonomy Fund, it is only DAU that has positive and significant effect on the expenditure of goods and services. On the other hand, after the DAK Special Autonomy fund, DAU and PAD also have significant effect on the expenditure on goods and services. The special autonomy fund has no significant effect, either through capital expenditure or expenditure on goods and services. The allocation of capital expenditure and expenditure on goods and services have significant effect on economic growth and the decrease in Gini ratios, both after and before the Special Autonomy Fund.

### Suggestions

In order to have significant effect on economic growth and Gini ratio decrease, the local government needs to allocate carefully the Special Autonomy Funds for the allocation of capital expenditure, especially for infrastructures. The allocation of expenditure on goods and services is mainly in the field of education services to encourage the improvement in Gini Ratio.

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## Georgia's Capital Market: Functioning Problems and Development Directions in Association with European Union

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### Abstract

The paper represents the study of ongoing tendencies on the Georgian capital market; the relationship between executed legislative infrastructure and institutional reforms has been established. The purpose of the work is to analyze the characteristics of formation and functioning of capital market in Georgia, to identify existing problems and develop ways to solve it.

In the paper it is established: whether the capital market development reforms in Georgia are in the right direction; is it possible to improve investors' rights on the capital market as a result of changes? The following is stated: what significant importance has comprehensive policy development for country's capital market development; on which principles should stay on, which direction and order should develop capital market; what is needed to achieve the goals set in the short and medium periods; what role should participants play in this process.

In the summary of paper planned reforms for Georgia's capital market development and their possible outcomes are given, considering European experience, the author's recommendations are presented in terms of effectiveness of these measures.

**Keywords:** capital market; investments; regulation

**JEL Classification:** D53; E22, E44, G10, G18, O16; O20

### Introduction

The development of the Securities Market plays an important role in the economy of the country. According to Bayadyan *et al.* (Bayadyan and Baghdasaryan 2017, 92) the development of the capital market is an important factor affecting the potential for economic development and sustainable economic growth in the EAEU countries. After the collapse of the Soviet Union and the transition to a market economy in the post-Soviet space, disparate financial markets were formed. This disparity is especially evident in the capital market. For Georgia as an open economy, the capital market is the best way to attract investments. Georgia in the current economic situation and its development is highly dependent on the functioning of the capital market and the sustainable existence of modern political-economic situation unconditionally requires entrepreneurial and corporate financing activities diversified approach, which the bank-lending segment alternatives Establishment Will contribute. This will have a greater likelihood of creating a synergistic economic effect in the state, which will greatly benefit the country's economic evolution and directly reflects the welfare of society.

Two parallel processes for the long-term development of the economy are underway in the past 20 years: on the one hand, the model of Georgian capitalism and on the other hand is a functioning Georgian financial market (Khishtovani 2012, 2). Unfortunately, these two interconnected phenomena are distinguished by its sequence and obvious mutual contradiction, which ultimately puts the country's economic development under question.

In 1858, British Prime Minister William Gladstone pointed to the importance of the financial sector to the economy: "Finance is, as it were, the stomach of the country, from which all other organs take their tone".

The financial sector is particularly important for the restructuring of capital and therefore for the creation of a permanent restructuring base of the economy. In the term "capital" we generally mean property that gives profits, income. The income of the property may be in the form of money, securities, material assets, especially land ownership or enterprise. The property of money is called money or financial capital, in contrast to the property of material goods called subject or real capital. The term "Capital Market" refers only to financial capital. That is why Capital Markets are always financial markets, not subjective markets (Juurikkala 2012, 88).

Modern scientific or Practitioners have long been discussing the development of the capital market, but the low level of awareness of the masses of the society in this area is the nihilistic attitude of the population and the business. It adds to the fact that the state does not take sharp and principled steps in this direction due to various

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objective and subjective reasons, which, in the end, still affect our country's economic situation. In the latter case, the existing monetary credit policy, which has been adjusted to the agenda, underscores the fact that the necessity of improving the economic situation of the country and the creation of alternatives to corporate financing and capitalization sources should not be questioned. The economic power of the state depends on the successful and successful activities of private entrepreneurs. In turn, private business needs a "source of energy" and it should not be any way dependent on bank financing.

Finding the capital necessary for business development in Georgia is quite difficult and business is not growing rapidly, accordingly, the budget loses income source as taxpayers (Baindurashvili 2017)<sup>13</sup>.

Figure 1. Georgia cotuption rank



Source: Trading Economics, (2018). <https://tradingeconomics.com/georgia/corruption-rank>

Unfortunately, the absence of a functioning capital market in Georgia is clearly visible, and it is absolutely clear that the low level of trade with its main instruments on the Georgian stock exchange. The World Economic Forum, which is a major factor in hampering the competitiveness of the Georgian economy, is named after the World Economic Forum, "Global Competitiveness" (World Economic Forum).

The Georgian banking system could be a hindering factor and suggested that its monopoly is one of the main reasons for the low market capitalization of the Georgian financial market. Also Corruption, which has a negative impact on the growth of the country's economy, the value of enterprises, capital expenditure and the quality of corporate governance.

As a rule, banks hampered further development of the financial system due to the threat of expected competition. Although empirically strengthening the problem of cross-border movement of goods and capital as a means of solving this problem (slowing down the financial market), these conditions on the paper are exemplary in Georgia, but it is not possible to overcome the above resistance. The reason for this may be the weak institutional organizing of the state of Georgia (non-existent transparency, weak legal protection of investors). Empirically proven that under the weak protection of small shareholders, capital market development process is getting more difficult (Modigliani and Perotti 1997) and groups of interested people prefer to lend money from bank (Modigliani and Perotti 2000). In institutionally weak countries, investors prefer to finance already existing local credit institutions and implement direct foreign investments (FDI) than the so-called Portfolio investments.

It is fact that in institutional investors' portfolio share of alternative investments is not extensional what could be recommended by optimization based on historic data. Such observation and approach is not new (Abuselidze and Beridze 2018). Many authors, such as Brown, Goetzmann and Park (1999), Swensen (2000), and Asness, Krail and Liew (2001) criticized historic income and risk parameters, which were used during such analysis (Terhaar *et al.* 2003, 102).

The way out of the situation is the development and development of the capital market. One of the real leverage of the country's economy is to attract investments, the most accepted and practical form of investing in securities through the stock market.

For example, the degree of execution of Georgian tax law should be sharply increased, which is empirically, as a rule, increasing the value of enterprises and improving the quality of corporate governance.

<sup>13</sup> Half of the surveyed Georgian small and medium companies name the market as the main challenge, the remaining 40% consider the funding to be the main problem, and only 10% considers access to knowledge as the main problem. (World SME Forum)

## 1. Literature Review

A rather large number of studies have been devoted to the analysis of the problems affecting the development of the securities market in the post-socialist countries over the past twenty-nine years. In most studies, the problems associated with the development of the securities markets are addressed by individual countries. Some studies help address the development of individual segments or functions of the securities market.

Financial markets become integrated when economies strongly depend on one other. This process not only reduces transaction costs, but also improves the efficiency of information sharing. However, although financial integration increases overall market efficiency, it reduces the diversification benefits available to prospective investors. Thus, investigating the dynamic process of financial integration allows us not only to measure the interdependence of economies, but also to provide useful information for investors (Yang, Lu *et al.* 2018).

The investment functions of the capital market have been studied in detail. They address the peculiarities and problems associated with the development of the capital market were mainly considered in the context of accelerating economic growth (Mirkin 2002, Dementyev 2009, Bessarabova 2013, Djibuti 2016), as well as from the point of view of the development of certain segments of the securities market, regional markets or market development in foreign countries (Kudinova 2005, Vahrushin 2009, Fesiashvili 2017, Paresishvili 2017). The problems associated with the regulation of the securities market were considered mainly in the context of the regulation of the entire financial system (Fabozzi *et al.* 1994, 2009), as well as from the point of view of self-regulation mechanisms in financial markets (Ilyin 2012, Burduli *et al.* 2017) and the regulation of the services of professional securities market entities.

Methods of research: Deduction, Synthesis, comparative analysis of scientific literature, statistical analysis, Historical approach.

## 2. Problem Formulation and Methodology

### Study methods

The study uses statistical and dynamic data from Georgia and different countries (including the post-socialist countries, which are members of the EU), which represent the development and capacity of the capital market, as well as legislative acts that are important for business entities.

### Capital market formation retrospective

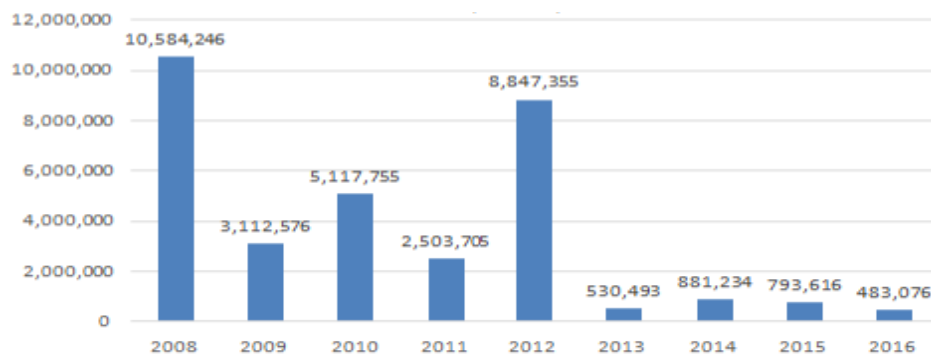
After a few years with stagnant growth in the early 1990s, a period of securities market growth and restructuring ensued that was dramatic in all respects, particularly from the mid-1990s on (Engdahl 2018). In the 1990s, the Georgian financial market has been at least two serious attempts at establishing a strong capital market.

Prior to 2007, the capital market supervision was carried out with the norm that was created in the early 90s with the help of various international organizations, and largely united in the United States in the early 1990s to the Securities Markets.

In the same period, the Georgian Stock Exchange was established with the assistance of USAID and it counts its existence from 12 January 1999 (Georgian Stock Exchange). About one year after the establishment of the IBSB was licensed and granted status of the first self-regulated organization in Georgia. According to Engdahl (2018) Although licensing employees have developed and become a significant aspect of governance in an increasing number of finance and securities markets during the twenty-first century studies on this type of licensing don't seem to exist. Some remarks about what generally can be the driving forces for private actors to invest in self-regulation might therefore be necessary as a general analytical framework. Since March 2000, Georgian Stock Exchange is underway with securities trading operations. It offers an effective investment mechanism both local and foreign investors. Mobilization of investments is one of the actual leverages for progress of national economy. The preference is given to the securities instead of the practical means of investing (Abuselidze 2013). Generally, mixed investment policy analysis is based on historic data (Gaurav *et al.* 2003). Such approach is acceptable for ordinary assets that are frequently traded and observation on their prices may be carried out based on historic data. "At first glance, the organized market was created which brought together all the financial instruments of the enterprise and allowed investors to provide them with favorable transactions through a more or less organized system" (Geradze 2016). However, the Securities Market, which was similar to the system, showed that the activity that was fixed on it was due to legislative requirements and not the market demand. As soon as this demand was abolished, the market turnover was also reduced.

Transactions made by the issuers on the IPSB are distinguished by years of variable information. As of 2007, there is a tendency to increase the number of transactions that we can not say for later years when the number of transactions decreases sharply and only 246 in 2014.

Figure 2. Collective data of transactions recorded by the issuers



Source: Compiled by the author

2007-2014 was hard for Georgia's corporate securities market (Assessment of Economic Reforms). In 2007-2008, there were three events that prevented the possibility of realizing the possibility that this market was already in the process of construction. In our opinion, the following three events are: a) Global financial crisis, b) a war with short-term but long-term effect of the August 2008 Russia-Georgia and c) "third event", which took place before 2007, a short period before the Securities Market About the Law of Radical Changes Package. Despite the fact that the changes were made in the context of "liberalization", the adoption adopted a dramatic decline in trade transparency.

The aim of the amendment was to improve existing legislation, abolish the requirements of inactive and overly obligations and propose liberal legislation relative to the market and its participants at the lower stage of development. Before the changes were possible only trading on the market, the investor had no opportunity to run a deal with a public-stock paper outside the platform. New edition of the legislation introduced the concept of non-transactional transaction. The investor was given the opportunity to use a brokerage company as a mediator or to direct a direct transaction. At the same time, in order to prevent price transparency and any possible inaccuracy, the legislation was defined by the legislation. Fixing obligation that ensures systematization of information on transactions made with public securities and avoiding attempts to "double bargains".

It was important that the steps towards liberalization in the market were important: there was only one stock exchange and a central depository that was allowed. The amendments made it possible to become all stakeholders in the case of the abovementioned financial institutions (Exchange and Depository) license and to meet the established requirements, to carry out relevant activities (Ministry of Economic Development; Ministry of Finance of Georgia; National Bank of Georgia, 2016).

The seemingly limitations of many developing countries are no longer a hindrance to market development, it refers to investors 'access to various segments and instruments, including non-residents, as well as financial intermediaries' rights to offer a variety of products and services to their clients Nuts. However, it was necessary but not enough to make the market grow and develop.

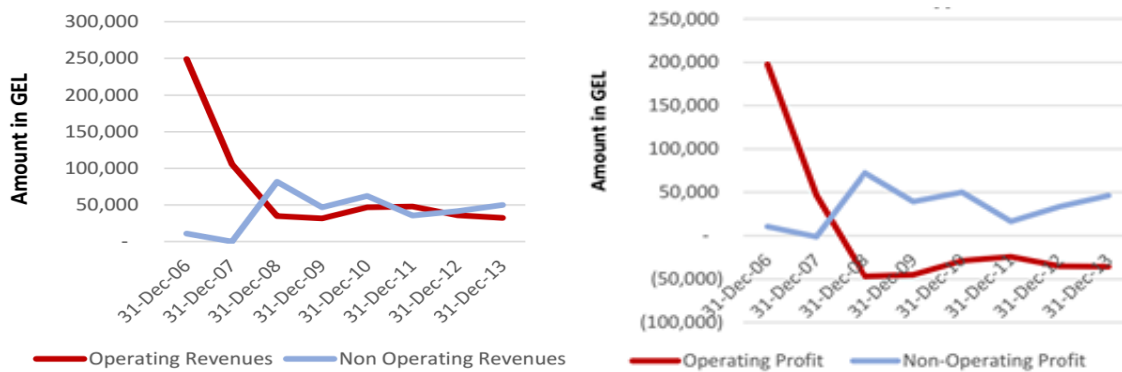
#### Capital market formation and regulation issues

The Law on capital market establishes reporting requirements for enterprises, which in accordance with international accounting standards and regulatory body established by the forms should be drawn up, company's financial situation in order to ensure access to information for all interested parties, as shares Nations as well as potential investors. Supervision over the respective reporting requirements is the prerogative of the capital market regulatory authority, but it is not clear what measures or responsibilities can be taken when identifying or breaking these requirements is not clear after the legislative amendment adopted by the regulatory body under the so-called "liberalization" of 2007. 1999-2007 years, the independent regulatory body - the National Securities Commission, was equipped with an administration proceeding and imposition of administrative sanctions authorized in 2007, But also for the emission of securities, as well as for transactions related to transactions and for the manipulation of the securities market was removed from the "Administrative Code of the offenders". Is there a so-called "liberalization" of legislation that will protect the investor from the actions or inactivity of the violators of the law?

Also, as a result of the amendment of 2007, the demand for trading through the stock exchange of all transactions on the stock exchange was withdrawn. The problem was not so much in motivating the changes, as far as its lack of implementation. The amendments did not result in the obligation to perform the best of the transaction imposed on brokers, and the stock exchange was not authorized to accept the transaction from the members on the "stock exchange" only. Brokerage companies involved in the transaction, the investors' behalf, or raised their own funds involved in the transaction, providing counseling investors, brokers will examine investor interest securities and the attractiveness of investing in funds, correct, and the potential benefits, risks and minimizing their opportunities Blob and an investor in most cases, based on the opinion of qualified and experienced professionals. According to Article 18, paragraph 1 of the Law of Georgia on Securities, a second transaction of public securities can be concluded both on the stock exchange and outside the stock market, according to paragraph 4 of the same article: "Public securities transactions can be concluded by brokerage companies with or without participation".

The first reports of the "liberalization of the legislation" indicate the 2010 Annual Report of the National Bank of Georgia, as of December 31, 2010, allocated 128 issuer's securities in the Georgian stock exchange system. The total amount of securities transactions amounted to 101.2 million lari for the reporting period. Out of this, the trading session was concluded with a 5.1 million GEL transaction and a transaction of 96.1 million lari out of the market (National Bank of Georgia 2010). During the year 2015, the central deficit decreased by 10.2 million lari in cash flow, as for the number of transactions compared to 2014, 78% decrease (National Bank of Georgia 2015).

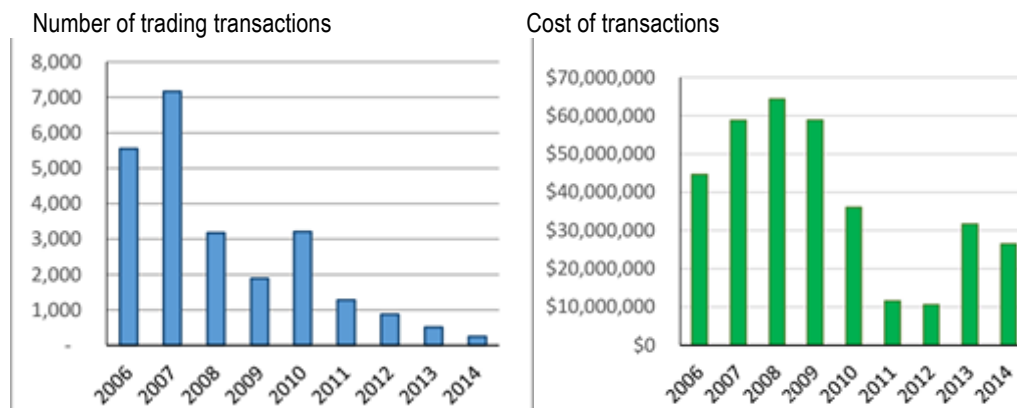
Figure 3. Income and profit of central depository securities of Georgia (2006-2013)



Source: Capital Market of Georgia (2015). Diagnostic study and recommendations. Available at: [http://www.economy.ge/uploads/meniu\\_publicaciebi/ouer/CMWG\\_Diagnostic\\_Report\\_12\\_May\\_2015\\_GEO.pdf](http://www.economy.ge/uploads/meniu_publicaciebi/ouer/CMWG_Diagnostic_Report_12_May_2015_GEO.pdf)

It should be noted that "Improving Mobilization of Internal Resources" The working group of the Capital Market (Capital Market Working Group), organized by the authoritative international experts invited by the Government of Georgia within the framework of technical assistance, conducted the diagnostic study of the Capital Market of Georgia and established the trends in the project dated May 12, 2015 Was identified during 2007-2014 years and resulted in the legislative amendments made in 2007.

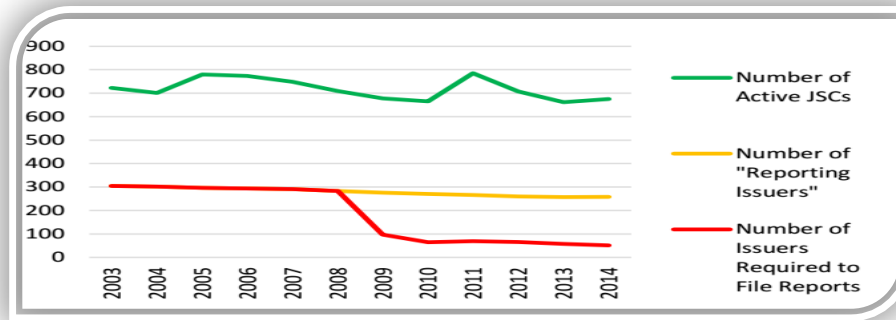
Figure 4. Local corporate securities trading trends (2006-2014)



Source: Capital Market of Georgia, (2015). Diagnostic study and recommendations. Available at: [http://www.economy.ge/uploads/meniu\\_publicaciebi/ouer/CMWG\\_Diagnostic\\_Report\\_12\\_May\\_2015\\_GEO.pdf](http://www.economy.ge/uploads/meniu_publicaciebi/ouer/CMWG_Diagnostic_Report_12_May_2015_GEO.pdf)

In 2007, the amendments to the Capital Market Act also significantly reduced the number of companies that were required to submit their reports publicly. As a result, transparency of the Georgian joint stock companies was no progress, but regress. In 2014, the number of accounts that is 675 active joint-stock companies, only 258 was the "accountable enterprise". 207 out of this quantity were used by the National Bank of Georgia, and only 51 enterprises were reporting annual and periodic reports. Such transparency was just negatively affecting investors' participation.

Figure 5. Transparency of Issuers



Source: Capital Market of Georgia, (2015). Diagnostic study and recommendations. Available at: [http://www.economy.ge/uploads/meniu\\_publicaciebi/ouer/CMWG\\_Diagnostic\\_Report\\_12\\_May\\_2015\\_GEO.pdf](http://www.economy.ge/uploads/meniu_publicaciebi/ouer/CMWG_Diagnostic_Report_12_May_2015_GEO.pdf)

Decree N170 / 01 of December 28, 2010 of the President of the National Bank of Georgia (NBG) approved the "Procedure for Implementing Public Offers of Securities in Georgia by the Securities and Issuer of Securities Accredited by Foreign Securities" and "List of Foreign Countries Recognized Stock Exchanges" (Legislative Herald of Georgia, 2015). According to the above rule, public offer of securities in Georgia may be valid for approval of the emission prospectus: 1. Securities approved for one of the recognized stock exchange of foreign countries (Article 3, P1); 2. Securities which may not be permitted on a foreign exchange market, but provided that the other securities of its issuer are permitted on the Exchange (Article 3, Pillar 2). In the first case, if the investor can see the information about securities in place of its emissions, the risk is that it will not be possible for the investor to receive information on securities, as there is no possibility to have them at all. The so-called "list of recognized stock exchanges", which is approved by the NBG and is listed in the list of 111 countries. The criterion of "recognition" is not given and the only way to build trust for the investor is to share the opinion of National Bank of Georgia or not share it.

For example, the Romanian legislation on the capital market (Law no. 297) gives particular importance to the information that must be made available to investors so that the latter can understand the risks they expose to when deciding to make an investment. This "essential information" must be decisive for the investor and must be structured in such a way as to define the risks to the latter's understanding.

The National Financial Supervisory Authority (ASF) is bound to regulate the prudential requirements that financial investment firms must meet in order to be able to properly assess risks, provide effective investor protection, and ensure that the financial market is stable and competitive.

Public offers of securities must contain information to enable the investor to make an informed decision: prices, risks, compensation schemes, etc. Companies operating on the securities market are required to comply with the authority's regulations on transparency, investor and authority information, reporting of data requested by the authority, etc. (Popescu 2018).

The Croatian regulatory framework of the capital market has been intertwined with the company and accounting laws, capital market regulation, stock exchange admission to trading and listing rules, and a number of by-laws. A set of capital market laws encompasses:

- Act on Issuance and Sale of Securities (later Securities Market Act, and thereafter Capital Market Act);
- laws regulating institutional investors' presence such as Law on Investment Funds and Law on Mandatory and Voluntary Pension Funds, laws regulating operations of insurance companies, foreign investors, privatization investment funds;
- laws regulating the supporting institutions on the market such as Central depository and clearing company, the stock exchange, and supervisory agency;
- a set of by-laws prescribing maximum allowed percentage of institutional investors' assets invested into certain types of financial instruments and/or certain types of issuers (Seba 2017).



For public offer of securities, if it concerns the issuance of new class securities, there should be a single regime for all issuers - whether it is a resident or not. It is also confirmed that by April 1, 2013 the N170 / 01 of the President of the National Bank of Georgia made amendments to the order and the list of the recognized exchanges remained in the list of 111 countries (Legislative Herald of Georgia, 2013).

By the amendment to the Law on Capital Market of September 24, 2009, enforcement of this Law and supervision of the Capital market went to the National Bank of Georgia. NBG became the financial sector magnate. Under the Organic Law of Georgia on the National Bank of Georgia, one of the functions of NBG is supervision of the financial sector (Article 3, P3, subparagraph "b"). The goals and objectives of the financial sector supervision are given in Chapter 8 of the Law "Supervision of Financial Sector". Here is the task of investors' rights protection (Article 47) and the norms specifically to be implemented on the Capital market (Article 52). In addition, the amendments implemented in 2009-2010 increased the sanctions envisaged by the Law on Securities. According to Article 55 § 1 of the Law, the types of violations of securities legislation shall be determined by this Law and the amount of penalties and the rule of their imposition in accordance with the rules established by the National Bank of Georgia. It was desirable that the rule and amount of imposition of funds was to be specified in the law.

### **3. Research Results**

The work is innovative in terms of its approaches and recommendations, as well as in a new perspective of researching topics. The issues raised in it and these provisions may be used to consider the existing theoretical positions regarding the peculiarities and shortcomings of Securities Market development. In addition, the theoretical significance of the thesis is that the issues discussed in it and the expressed opinions are polemic and requires further depth research. Consequently, it can become a motif and a major base for further studies in the given direction.

Practical realization of the conclusions, recommendations and proposals received as a result of the research will support the country's financial stability and sustainability of economic growth, increase population revenues, create adequate economic strategy, attract investments, and complement the process of formation of alternative sources of financing.

### **Conclusions and suggestions**

The importance of the European reforms to Georgia stipulates the country's aspiration to enter into European legal and economic sphere and commitments undertaken by the Association Agreement with Europe. Under Article 320 of the Association Agreement concluded between Georgia and the European Union, the obligation of the Partnership for the purpose of ensuring effective and adequate protection of investors and other financial services in financial services is determined. In addition, under Article 417 of the Agreement, Georgia is committed to gradual approximation of its legislation with EU law. Implementation of norms in compliance with European standards in national law, in turn, is an important precondition for the development of a developed financial system.

There are important arguments in favor of the fact that development of investor protection legislation will contribute to the development of the securities market. The general level of legal / institutional development related to financing countries with emerging markets increases the trading of the securities market.

In the context of the importance of European reforms for Georgia, the Swiss example should be mentioned. It is not a member of the European Union and it is not obliged to harmonize its own legislation with the European Union's reforms. Nevertheless, Switzerland has initiated significant reforms in financial regulation, in order to harmonize national divisions with European regulations, namely MiFID's requirements (Markets in Financial Instruments Directive). The new Swiss law of financial services (hereinafter FIDLEG) is widely based on European Union legislation and reforms. The main objective of the amendment is to maintain the international competitiveness and attractiveness of the Swiss financial center by approximating the laws of the European legislation. FIDLEG is acknowledging that national banks and the financial system can not compete with competitiveness and efficient functioning without harmonizing with the European Law of Justice.

Based on the above mentioned, it is important that Georgia begin to implement its own legislation in the Capital Market. Prevention is better than treatment:

- The Georgian legislation should be improved despite the level of Capital Market development, so that it is ready to increase the role of Capital Market. Georgian legislation should be introduced into the Capital Market for small investors category and norms for the protection of investors that are tailored to this category. It is important that national regulation should not be limited to regulating the capital market and spreading trade outside the stock market, especially as the "gray market" (An unofficial market for any kind of trade can not be traded within the traditional regulated market).



- The Georgian Securities Regulator should become a member of IOSCO. The fact that this has not happened yet has caused some negative consequences for Georgia: at least in the Securities Market, it depreciates Georgia's reputation (factor whose numbers are difficult to convey); This also means that the National Bank of Georgia does not have access to the IOSCO's very important resource base for capacity development and accumulation of knowledge. It also implies that such infrastructural institutions, such as the Georgian Stock Exchange and the Central Deposit of Securities of Georgia, are not able to become associated members, which are still repeat the chances of reputation and reinforcement.
- Reinstatement of the National Stock Exchange of Georgia by the necessary attributes of the stock market;
- The National Bank of Georgia, as the regulator of commercial banks and the institution of their interests, shall be deprived of exclusive right to control the stock market;
- Should be abolished The rule of sale of "fixing", or outside of the stock exchanges, resulting from which resulted in the creation of a non-transparent financial market;
- The strict policy towards brokerage companies should also be mitigated, as a result, in Georgia, in fact, there is no intermediary link between the commercial bank - the brokerage company.

The development of the Capital Market ensures the promotion of liquidity market capital in Georgia, diversification of the financial system, increasing access to long-term investment resources, downtroding the economy and increasing sustainability toward financial sector shocks.

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## Capital Structure Optimization in Russian Companies: Problems and Solutions

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### Abstract:

The research is based on the need for the solutions of the problem of capital structure building, which is one of the crucial aspects of the companies' financial management activities. The aim of the research is to justify theoretical and methodological grounds for the optimization of the company's capital structure and its more efficient use. Having observed the contributions into this issue made by other scientists and the results achieved, one should admit that the effective solutions of problem of current assets structure optimization and their efficient use, in particular in some Russian companies, have not been found yet. All the above mentioned caused the need for this research.

The paper outlines the relevance of the chosen policy on financing assets; it also describes the criteria for this policy based on "aggressive", "moderate" and "conservative" indicators. To assess the impact of internal and external environment, we built a cross sectional analysis matrix which can be applied to identify the most crucial for the capital structure factors and to find the ways to respond to them. We also suggest the way to optimize the company's capital structure by the "Sustainability" and "Profitability" criteria using the example of the Russian company. Having analyzed the factors of external and internal environment and the company's assets, we assessed the capital structure deviation from the optimal by criterion. The obtained results can be applied to assess the mechanism of building the company's current assets. Moreover, the analyzed and well-grounded criteria can be taken into consideration for the development of the corporate policies in the majority of the Russian companies. Theoretical generalizations made in the paper can be used as a ground for scientific debates as well as for other scientific and educational purposes.

**Keywords:** factors; assets; efficiency; investment; rating assessment; constant increase

**JEL Classification:** E22; G31; Q16

### Introduction

In the market economy, the process of the capital building, its structure optimization, the identification of the optimal ratio of various sources of financing as well as the quality of resources management are of utmost importance. The sufficient amount of the capital plays a crucial role in maintaining the performance of an economic entity through its lifetime providing its liquidity, sustainability and solvency. Moreover, a possible increase in the investments into national economy and the expansion of the goods and services market depend on the amount of equity. The optimization of capital structure is one of the most important and complex problems to be solved by the financial management of the company (Tzabbar and Margolis 2017, Gary *et al.* 2017, Pavlova 2012). The chosen policy in this sphere influences both long-term and short-term financial sustainability of the companies and helps to rank the

sources of financing according to their priority and cost. All abovementioned justifies the relevance of this research for more effective development of the Russian companies.

Optimal capital structure building, i.e. the identification of the best ratio of equity and debt, is a 'key' problem of the financial management (Georgiou 2007, Kornai 1998, Chiou and Tucker 2017, Um 2017). This problem was considered by the most outstanding scientists in the financial sphere including such Nobel prize winners as Merton Miller and Franco Modigliani. Nowadays this problem is still urgent and has been a focus in the works of both Russian and foreign scientists including Blank I.A., Denisov A.Y., Kolpakov V.M., Kovalyov A.P., Savchenko E. and others. Our research is based on the works of the Russian scientists, such as Gayfutdinova N., Kokoreva M., Stepanova A. and Tamulite Yu., who investigate the determinants of capital structure in the Russian companies. Foreign scientists, whose works are of importance for our research, are Brealey R., Brigham E., Gapenski J., Damodaran A., Krischwitz L., Loeffler A., Myers S., Miller M., Modigliani F., Taggart R., Tham D., Fernandes P., Ferris K., Sharp R.U., etc.

## 1. Materials and Methods

Capital structure building is a controversial problem of the corporate policy. The difficulties arising in the process of searching for solutions can be divided into several categories. First, they can appear during the initial analysis of this ratio if this analysis is based only on the data from the financial statement of the company (Sysoeva 2007). Second, quantitative assessment needs to be supplemented by the qualitative expert analysis of a certain range of macro- and microenvironment factors influencing the choice of financing policy (Kunitsyna and Pleshkova 2008). The approaches to the search of optimal capital structure developed in the theory of corporate finance can be classified as follows. There are a lot of micro- and macro-environment factors which influence the decisions of the company's management on the choice of the financial sources. For a number of these factors, the relationship between the capital structure and the cost of the company can be described in mathematical terms with a high degree of accuracy. The integral index of capital structure sustainability that characterizes the degree of the impact of the mentioned factors on the company was calculated. We applied the prioritizing method to assign the relevance rating to each of the factors showing its relative relevance in comparison with other factors influencing the sustainability of the capital structure. For every factor in question, the average rating was identified by calculating the weighted average that could be used to find the integral index taking into account the assessment of the factors mentioned and their rating relevance in general characteristics. In addition, when calculating this index, the relevance of these factors depending in their controllability was identified.

The integral index of the capital structure sustainability is calculated by the following formula:

$$CSS = \sum_{i=1}^n AI_i * RR \quad (1)$$

where:  $AI_i$  is the average index by  $i$ -factor;  $RR$  is the relevance of  $i$ -factor in total assessment;  $i$ -n is the number of factors (Malashuk 2016).

Internal factors are subject to the management most of all. It enables us to assess their level of relevance in the general assessment as high – 50%. On the contrary, the external factors outside the company, which influence its indicators, are instable and constantly changing. The external environment is the substantial element of the marketing system of the company; it is a structured object depending on the aims of research or a researcher's view of the existence of the potential problems in some areas of the environment.

## 2. Results and Discussion

The problem of capital structure is urgent for both Russian and foreign companies. Due to objective reasons, the first theories of capital structure emerged in the European countries in the middle of the 20<sup>th</sup> century. However, as Brealey R. and Myers S. state, there is no any commonly accepted clear theory of capital structure. The main factors influencing the strategies of the Russian enterprises for the current year are the duration of the world financial crisis and geopolitical instability (Akhmetshin *et al.* 2017). The policy on building and using its equity chosen by a company for its development will mainly depend on the company's own resources available for the growth. To analyze the impact of internal and external factors, we created a cross sectional analysis matrix (table 1) which can be used to identify the most important factors influencing the capital structure of the company and find the appropriate ways to respond to them (Fedorischeva 2011, Elizarova *et al.* 2017).

Table 1. The cross sectional analysis matrix of the factors influencing the efficiency of management in the course of capital structure optimization in the company

Factors		Factor influence scale				
		Zero	Low	Weak	Moderate	Strong
Macro environment factors	Financial factors	Financial market conditions				
	Legal factors	Efficient legal support				
	Technological factors	Developed financial structure	–	–	–	–
	Natural factors	Vacation period	–	–	–	–
	Socio-cultural factors	Promotion of the company' sustainability	–	–	–	–
	Industry dynamics	Business development				
	The level of competition	The place in the certain niche				–
Mezo-environment factors	Regulatory framework	Change tracking				–
	Taxation system	Profit understatement				
Micro environment factors	Share holders' control	The choice of the dividend policy				
	Creditrating	Rather high rating				
	Financial flexibility	Access to different financing sources				
	Competitive position	The place in the certain niche				
	Responsive groups of consumers	Company's capital ratings publication				–
	Consumers	Capital growth				
Internal factors	Capital management strategy	The choice of the optimal strategy				
	Managers' expertise	Highly-qualified managers				
	The degree of control automation	The wide use of modern information technologies				

Source: Fedorisheva 2011.

It is obvious that financial and legal factors are the most crucial of all macro-environment factors for the development of the financial strategy as under conditions of economic recession and high inflation rates the riskiness of its financial activities substantially increases. Micro-factors are taken into account in the course of decision-making on profit allocation.

Under current conditions, every enterprise faces the problem of the choice and development of asset financing strategies that are an essential part of its financial policy and a tool for managing the resource potential. Its aim is to optimize the amount and the structure of financing sources as well as their forming to provide the efficient use of equity and debt (Main Issues of International Financial Reporting Standards). As it was mentioned before, to finance the assets, a company can apply different policies, such as aggressive, moderate and conservative. Their main features and criteria are shown in Table 2.

Table 2. The criteria of asset financing policies

Policy criterion	Aggressive policy	Moderate policy	Conservative policy
The quality of assets	– large relative share of current assets; – high rate of turnover; – high rate of profitability.	– optimal relative share; – average rate of turnover; – average rate of profitability.	– low relative share; – low rate of turnover; – low rate of profitability.
The structure of financing sources	– large relative share of short-term assets; – very high degree of financial leverage.	– average relative share of short-term assets; – medium degree of financial leverage.	– low relative share of short-term assets; – very low degree of financial leverage.
The allocation of financing sources	– at the expense of own sources and long-term loans;	– at the expense of own sources and long-term loans.	– at the expense of own sources and long-term loans.

Source: Main Issues of International Financial Reporting Standards.

The objectives of the research were implemented on the Russian company situated in Krasnodar region. The core business of OAO "Sedin-service" is the wholesale of operational goods and machinery and equipment parts as well as fitting, repair and maintenance of machines. It has been operating since 2002 and currently takes the leading position among the entities in this industry. The rating assessment of internal and external environment factors influencing its capital structure is represented in the table 3 below.



Table 3. The rating assessment of internal and external environment factors influencing the capital structure

FACTORS	FACTOR RATING
<b>1. External environment factors</b>	
<b>Macro-environment factors</b>	
1. Financial	0.27
2. Legal	0.01
3. Technological	0.06
3. Natural	0.03
4. Socio-cultural	0.01
5. Situation within the industry	0.62
Average rating index	0.727
The relevance of the corresponding factor in the total assessment, %	15
<b>Mezo-environment factors</b>	
1. Level of competition	0.30
2. Regulatory frame work	0.05
3. Taxation system	0.65
Average rating index	0.783
The relevance of the corresponding factor in the total assessment, %	10
<b>Micro-environment factors</b>	
1. Shareholders' control	0.20
2. Credit rating	0.30
3. Financial flexibility	0.25
4. Competitors	0.10
5. Consumers	0.10
6. Responsive groups of consumers	0.05
Average rating index	0.458
The relevance of the corresponding factor in the total assessment, %	25
<b>2. Internal environment factors</b>	
1. Capital management strategy	0.70
2. Managers' expertise	0.25
3. The degree of control automation	0.05
Average rating index	0.450
The relevance of the corresponding factor in the total assessment, %	50
The integral index of capital structure sustainability, %	52.7

Source: Compiled by the authors.

Taking into account the data from the Table 3, we can consider the 'situation within the industry' factor as the integral index of the development of the specific type of economic activities in the region (rating 0.62) as well as the 'financial' factor as one of the most difficult to formalize due to the underdeveloped financial market in the region (rating 0.27).

Thus, the cross sectional analysis matrix, which takes into account the impact of internal and external environment factors on the capital structure, and the methodology of their further consolidated assessment by assigning them rating indexes depending on their relevance, represents an efficient tool for the analysis of managerial decisions on the optimization of the company's capital structure.

The results of the assessment witness that the capital structure of OAO "Sedin-service" is vulnerable to the risk of unsustainability. The undertaken research showed that there is not any clear asset financing in OAO "Sedin-service". It can be described as mixed by the criteria and characteristics in Table 4. Consequently, all financial decisions are made by the top managers in response to current problems. However, according to IFRS, "an asset is a resource controlled by the entity as a result of past events and from which future economic benefits are expected to flow to the entity" (Georgiou 2007). Therefore, there are two ways of benefiting from assets: to use them as intended or to sell.

"The optimal assets are provided by the limits established for particular investment spheres and within them (the types of long- and short-term investments) (Malashuk 2016). As a rule, the main criterion for the amount of investments is the degree of their risk: the higher the risk is, the lower is the limit. When forming the company's assets, the acceptable risk of assets should be defined taking into account the financial capacity for risk covering. The index of the regulation of marginal corporate risks is the ratio between an overall risk and a sustainable capital as the latter can be used to cover possible losses (Malashuk 2016). The assets of OAO "Sedin-service" were

assessed on the “Profitability” criterion. For this purpose, the ratios of different types of assets in the company’s total assets were classified according to the classification described above. Table 4 shows that the share of yielding assets is less than 1.7%, which means that the share of non-yielding assets in the overall structure is up to 98.3%. It is obvious that the asset structure of OAO “Sedin-service” can be described as negative by the financial year of the analyzed period.

Table 4. Asset structure of OAO “Sedin-service” by profitability, 2016, %

Assets	OAO “Sedin-service”
1. Yielding assets:	1,690
Profitable investments in tangible assets	–
Long-term financial investments	0,010
Short-term investment	0,355
Intangible asset	–
Final product and buy outs	1,334
2. Non-yielding assets:	98,310
Fixed assets	20,500
Construction in process	0,100
Raw materials, material goods and other valuables	25,700
Expenses in production in	9,500
Accounts receivable	21,050
Cash assets	14,90
Deferred tax assets	1,70
Other assets	4,86
Total assets	100,00

Source: Compiled by the authors.

Under current conditions, a number of measures can be suggested. They are aimed at the redistribution of financing sources from the non-yielding assets to the yielding ones, the reduction of capital immobilization into fixed assets, raw materials and material goods, more efficient work with debtors, more efficient use of raised financial resources and diversification of structure of yielding assets that mostly include final products and buyouts.

“Prioritized investments in yielding assets taking into account their funding will lead to the optimal capital structure” (Malashuk 2016). To implement the suggested approach under conditions of constantly changing external environment, the sufficient amount of funds should be invested into specific assets, which form the basis for the permanent competitive advantages. The concept of the ‘specific asset’ means that it is advisable for the entity to invest both in valuable and exclusive assets which do not circulate in the market and cannot be either emitted or substituted. These assets are related to the company’s performance and include its trademark, technological structure, goodwill, know-how in organization and management, links with business partners and business prospects. Investments in property can also be considered as an exclusive asset under current conditions. First, due to the constant increase in the property cost, it can be viewed as a good source of income. Second, it is a reliable way to protect funds from inflation. However, investing in specific assets means taking higher risks. Therefore, grounds for the decisions on the choice of such type of investments should be followed by the analysis of the profitability and risk ratio. The investments in yielding assets taking into account their funding lead to the optimal capital structure.

## Conclusions

The conducted research showed that the company does not have any clear policy of financing its assets, which causes the need for the increase in the efficiency of their use. To implement the suggested approach under conditions of the constantly changing environment, we suggest investing into specific assets which form the basis for the permanent competitive advantages. The concept of the ‘specific asset’ means that it is advisable for the entity to invest both in valuable and exclusive assets which do not circulate in the market and cannot be either emitted or substituted. These assets are related to the company’s performance and include its trademark, technological structure, goodwill, know-how in organization and management, links with business partners and business prospects. Investments in property can also be considered as an exclusive asset under current conditions. Due to the constant increase in the property cost, it can be viewed as a good source of income. Moreover, it is a reliable way to protect funds from inflation. However, investing in specific assets means taking higher risks. Therefore, grounds for the decisions on the choice of such type of investments should be followed by the analysis of the profitability and risk ratio.

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## The Slovak Republic as a Partner in the Import and Export of Sugar

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### Abstract:

Worldwide, over 100 million tones of sugar are produced. Sugar trading is mostly satisfied with domestic demand, until surpluses are exported to other countries. When the price of sugar rises, it can be assumed that large areas will be planted until overproduction is achieved, but at low prices the areas are shrinking, leading to higher prices.

This contribution deals with the issue of import and export of sugar in the Slovak Republic. The aim of the contribution is to determine clusters of countries from which the Slovak Republic imports or countries where it exports sugar. We have used a method, which allowed us to organize selected countries according to defined variables into homogeneous clusters. Individual clusters have similar properties and differ from the characteristics of countries in other agglomerations. We have used a method that was selected for the clustering process – the Ward method, while the Euclidean distance was used to determine the degree of similarity of the objects under investigation.

**Keywords:** import, export, sugar, cluster analysis; Slovak Republic

**JEL Classification:** Q17; O13

### Introduction

Main intention of our contribution is the creation of clusters of countries which export and import sugar. The main condition of including the country into the analysis was its active participation with Slovak Republic in foreign trade of sugar. Based on the database obtained from Eurostat - the database on import and export of sugar, we have identified significant clusters of countries that are involved in import and export of sugar. We have chosen several factors as the basis for decision-making: price of sugar, quantity in tonnes of sugar, sugar import or export, and trade period. An important factor affecting trade of sugar, its exports and imports is its price. NYSE Euronext (LIFFE) in London is one of the most important sugar trade exchanges. Likewise, the Intercontinental Exchange in New York. The London stock market is trading in white refined sugar and the price is expressed in USD per ton, with a contract size of 50 tons. In the United States, raw sugar is traded, the price is expressed in cents per pound and the contract size is 112,000 pounds (Coester *et al.* 1982). Sugar can be traded through futures contracts, CFD contracts, or shares of sugar manufacturing and processing companies (Mitchell 2004). When processing our analysis we have used prices of sugar listed on NYSE London.

### 1. Research Background and Methodology

Graph 1 shows exports of sugar from Slovak Republic to the European Union. We can see that there has been a significant decline since last year in the commodity of white sugar, as well as the fact that in 2016/2017 there was

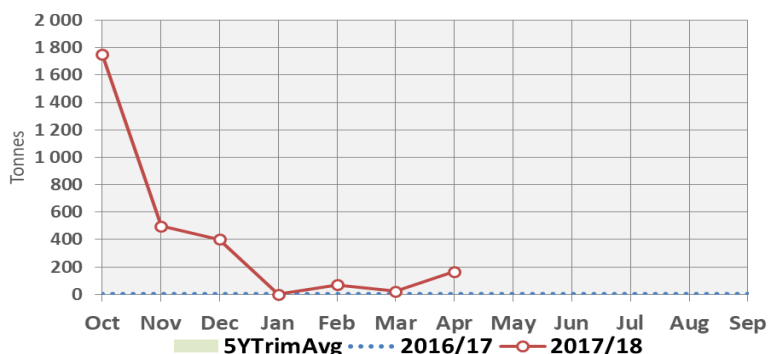
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no export of sugar from the territory of the Slovak Republic at all. Graph 1 contains also information about exports of white sugar as exports of raw sugar did not occur during the period under review (Eurostat 2018).

In Graphs 1, 2 and 3 are shown on the x-axis time series and on the y-axis the quantity of imported or exported sugar in tones. It should be added that the European sugar and sugar beet market has been developing very dynamically in recent years. The individual reform steps that have been implemented in the last two decades have greatly influenced its current shape and structure and also hence the import and export of sugar to/from the Slovak Republic (Řezbová 2014).

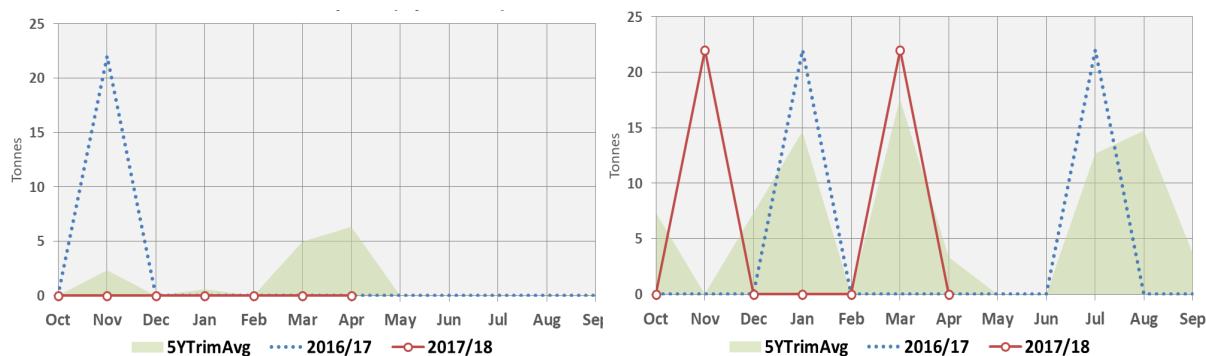
Graph 1. Export of raw and white sugar from the Slovak Republic



Source: Eurostat database

Substantial impact on sugar import and export had the termination of regulation of sugar production in the EU. Cancellation of production quotas brought several significant changes in the economic conditions of European sugar industry. Of course, the most important fact is that from the 1 October 2017 all EU sugar factories can produce sugar without any restriction, as well as sell without any other limits, not only on the domestic market or the EU market but also in third countries, because with the fall of production quotas, the system of export licenses that have regulated exports of sugar outside the EU have also been terminated (Reinberger 2018).

Graph 2 and Graph 3. Imports of white and raw sugar to the Slovak Republic in months



Source: Eurostat database

Similarly, the situation in imports show Graphs 2 and Graph 3. Imports from the European Union countries to the Slovak Republic were on a one-off basis in 2017/2018, which can be seen from the taperness of the curves themselves, for example between October and December 2016 (Eurostat 2018). We can also say that raw sugar is imported in larger quantities compared to the white sugar.

In the next section, we will perform a statistical analysis. First of all, there will be a cluster analysis under which author Vojtková (2007) understands a set of statistical as well as mathematical techniques through which we can identify clusters. A cluster is a set of identifiable objects close and similar to each other, but objects belonging to other clusters are of different characteristics. The clustering analysis procedure will be as follows:

- Entering input data,
- Selecting the variables,
- Object names,
- Choosing the agglomeration process,
- Choosing the Type of Bonding Method – in our case, it's Ward's method,
- Selecting the degree of similarity of objects, which we transfer on the base of Euclidean distance,

- Determining the number of significant clusters,
- Interpretation.

This method is suitable for diagnosing clusters of objects based on multiple variables. Clustering can be used in a number of scientific areas, its roots reach the field of medicine. Sakr (2014) in his research, diagnosed the incidence of early stages of lung cancer based on multiple variables in patients by cluster analysis. Schatz *et al.* (2014) analyzed asthma, where variables included gender, race, atopy, age of asthma, smoking (adolescents and adults), passive smoking (children), obesity and aspirin sensitivity. Klofnacher (2017) assessed the alternative transport network in Istanbul until 2023, using the cluster analysis. Cheng (2014) analyzed the effectiveness of e-learning at workplaces, which resulted in clusters of six e-learning environments for e-learning developers to focus on.

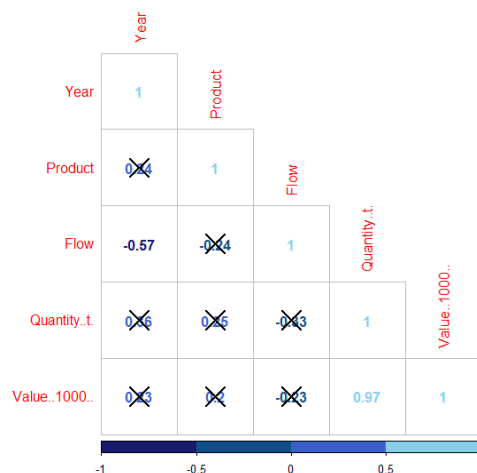
During the period under review, Slovak Republic made a total of 554 deals in sugar trade, of which imports represented 207 and exports 347 deals. As regards imports, sugar was imported from Mauritius, Serbia and other European Union countries. Most of the Slovak Republic exports headed to Canada, other countries of the European Union, Norway, Ukraine and the USA. The purpose of our analysis is to determine clusters of countries that have similar characteristics in the selected variables in import and export of sugar to and from the Slovak Republic. For analysis purposes, we have quantified averages in quantities and prices of sugar over the reference period from which the database of 28 countries in foreign trade of sugar (import or export) was created. Each country was defined by 5 variables. We have performed the analysis in the R studio software. We have used the Euclidean distance and the Ward method while using these variables:

- The country in which the Slovak Republic was a partner in export (1) or import (2);
- Year of import or export (2012-2018);
- Type of sugar which has been imported or exported - Sugar RAW (1), Sugar RAW and WHITE (2), Sugar WHITE (3);
- The quantity imported or exported in tonnes.
- Price for quantity imported in thous. EUR.

## 2. Cluster analysis

The first step before the clustering method is to test the dependency between variables. This test is performed on the basis of a correlation matrix that tests the dependence between the variables on the basis of alpha 0.05 significance, as shown in the following figure. By means of the crossover, the dependencies that can influence the aggregation results, can be seen in Figure 1.

Figure 1. Correlation matrix of input variables - year, type of sugar, import / export, quantity and price per ton of sugar



Source: own processing R- Studio

Since, on the basis of Figure 1, we can see that there is a correlation between several variables, it is necessary to use the main component method, which removes the correlation between the variables. The main component method is one of the oldest and most widely used multidimensional statistical methods, the aim of which is to linearly transform the original variables ( $X_1, X_2, \dots, X_k$ ) into new, uncorrelated variables, which we call the main components ( $PC_1, PC_2, \dots, PC_k$ ). These components are ranked according to importance based on the



scatter size they explain (Labudová 2010). This means that our variables: year, type of sugar, import/export, quantity and price per ton of sugar are in uncorrelated shape and have no original order. Consequently, it is necessary to choose how many major components we use for the clustering method. Based on the existing rules for determining the number of major components, we select the PC 3 main components. PC 3 explains 91.06% of the variability of the original data (with the condition that it must explain at least 70%). Table no. 1 shows in more detail the variance and variability explained by the selected variables PC 1 through PC 5.

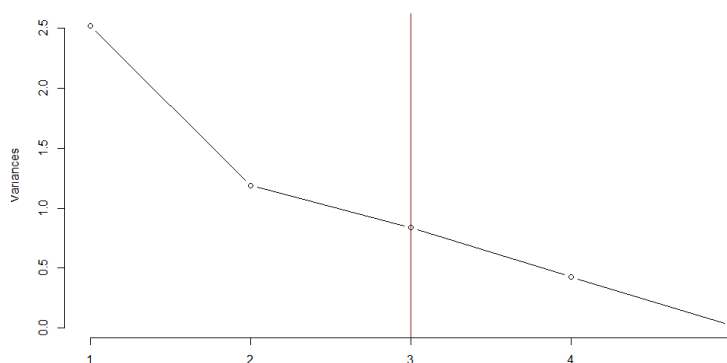
Table 1. Variance of variables

	PC1	PC2	PC3	PC4	PC5
Standard derivation	1.588144	1.091552	0.9162945	0.6522285	0.1459897
Variance	0.504440	0.238300	0.1679200	0.0850800	0.0042600
Variance - cumulative	0.504440	0.742740	0.9106600	0.9957400	1.0000000

Source: own processing R- Studio

To refine the selection of the main components, we can also use the screeplot of the main components, which can be seen in Graph 4, which allows us heuristically choose the number of main components, where we also decide for 3 major components.

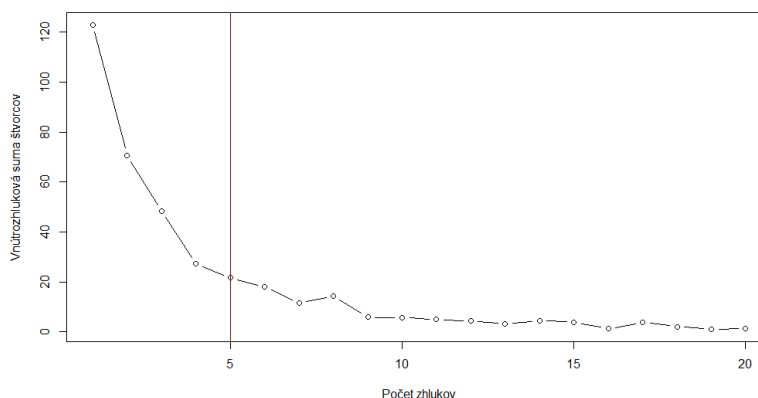
Graph 4. Screen plot of main components



Source: own processing R- Studio

Based on the three main components we've selected for cluster analysis, we can follow a hierarchical tree, also called a dendrogram, where 28 countries are represented graphically. The next step is choosing the number of countries' clusters in our analysis. Based on a heuristic approach, we grouped the enterprise sample into 5 clusters. However, we also used the Screen plot (graph no. 5) where the number of clusters is shown on the x-axis, and the y-square inner cluster sum of squares. The decisive criterion is to minimize inner cluster sum of squares, which is the optimal state.

Graph 5. Screen plot of number of cluster



Source: own processing R- Studio

The line dividing the axis determines 5 clusters and represents the optimum state when the inner cluster sum of squares has the optimal value. If we decide for more clusters, we can see that the inner cluster sum of squares would cause the number of clusters to be smaller. Conversely, a small number of clusters would cause the inner cluster sum of squares to be higher. The number of enterprises in each cluster is shown in Table 2.

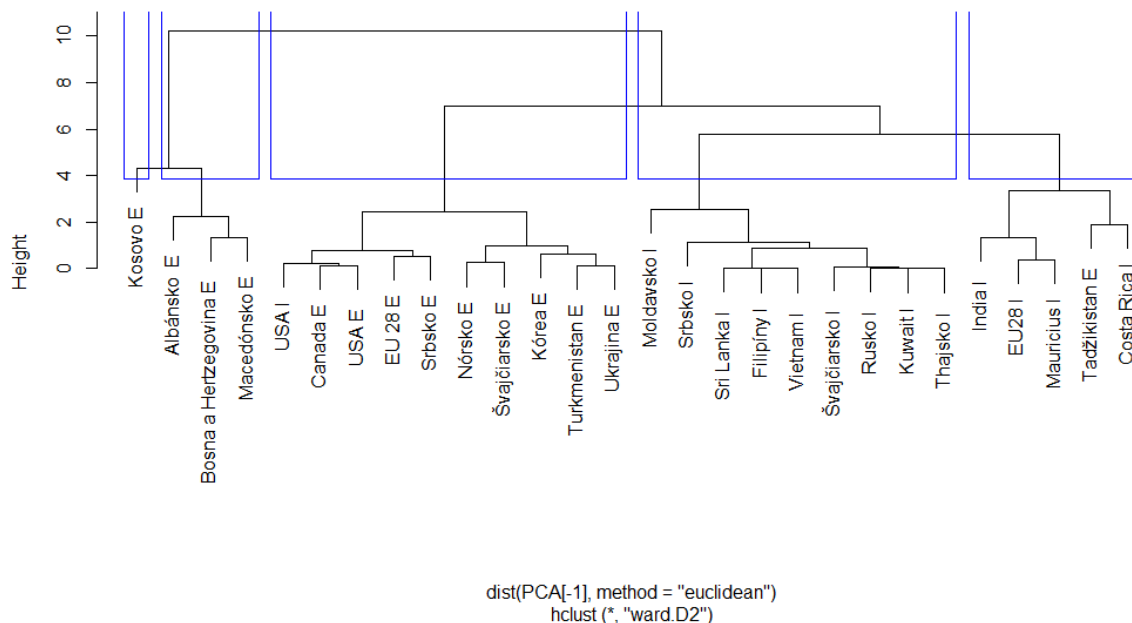
Table 2. Representation of countries in clusters

1. Cluster	2. Cluster	3. Cluster	4. Cluster	5. Cluster
3 countries:	10 countries:	1 country:	5 countries:	9 countries:
<ul style="list-style-type: none"> <li>▪ Albania;</li> <li>▪ Macedonia;</li> <li>▪ Bosnia and Hercegovina.</li> </ul>	<ul style="list-style-type: none"> <li>▪ USA I;</li> <li>▪ USA E;</li> <li>▪ Canada;</li> <li>▪ EÚ 28 E;</li> <li>▪ Serbia E;</li> <li>▪ Norway;</li> <li>▪ Switzerland E;</li> <li>▪ Korea;</li> <li>▪ Turkmenistan;</li> <li>▪ Ukraine,</li> </ul>	<ul style="list-style-type: none"> <li>▪ Kosovo</li> </ul>	<ul style="list-style-type: none"> <li>▪ EÚ 28 I;</li> <li>▪ India;</li> <li>▪ Mauricius;</li> <li>▪ Tadžikistan;</li> <li>▪ Costa Rica.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moldova;</li> <li>▪ Serbia I;</li> <li>▪ Sri Lanka;</li> <li>▪ Philipines;</li> <li>▪ Vietnam;</li> <li>▪ Switzerland I;</li> <li>▪ Russia;</li> <li>▪ Kuwait;</li> <li>▪ Thajland.</li> </ul>

Source: own processing R- Studio

Subsequently we have plotted the clusters in the hierarchical tree (Graph 6), where the clusters are marked. Each country is marked with a name. We can see that 5 clusters of countries have been created, that are heterogeneous but homogeneous within each cluster. This means, that countries in one cluster have similar characteristics in selected variables, while having different characteristics of variables with companies in other agglomerations.

Graph 6. Dendrogram



Source: own processing R- Studio

### Conclusion

Based on a hierarchical agglomeration cluster analysis, we have identified clusters of countries with respect to selected variables. In this analysis, we have identified 5 variables for countries. We have used distance measurement using the Euclidean distance. For the clustering analysis we have chosen the Ward method. By using the main components method, we have created clusters of countries, that are mapped to a dendrogram, that has sorted the countries on the basis of selected variables. Countries, were arranged in clusters that have similar characteristics and differ from those of other agglomerations.

Before we have proceeded to aggregation, we have examined relations between the variables. To determine the optimal number of clusters, we used a heuristic approach supplemented by a graphical assessment using

Screeplot, which showed the number of clusters and inner cluster sum of squares. The result is the identification of 5 clusters. The centroids (diameters) of the individual original variables in the individual clusters are shown in Table 3.

Table 3. Centroids of cluster

Cluster	Quantity	Price
1	274.866	77.382,222
2	8.170	3.301,021
3	637.850	176.610,000
4	19.559	15.013,064
5	16.690	12.907,460

Source: own processing R- Studio

Thus, we can say that the first cluster, which includes Albania, Bosnia and Herzegovina and Macedonia, dominates in the export of white sugar, with an average of 274 866,667 tones exported at a price of 77,380.22 EUR. To assess the result, we can also use the median indicators for clusters. The use of medians is due to the fact, that the average may be possibly influenced by extreme values. In median, this threat is eliminated as it is the value that divides the results into two equal halves. When using median (instead of centroids), for the first cluster (Macedonia, Albania and Bosnia and Herzegovina) variables of quantity and price of sugar are different (307,600 tones exported at a price of 84,670 EUR). We see that there are significant differences, which have occurred after the exclusion of extreme values.

The aim of the contribution was using of clustering method under the condition of import and export of raw and white sugar of the Slovak Republic, which was influenced the termination of restrictions in sugar trade in EU. On the basis of analyzes, we can say that exports from January to April 2018 exceed import, but only within the European Union. Based on aggregate analysis, we identified 5 clusters of countries that are grouped in import and export according to similar characteristics like price and quantity of imported or exported sugar and the period when sugar was imported or exported.

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\*\*\* EUROSTAT, Export, import. Eurostat database. 2018.

## Formation of Marketing Strategy for Promoting an Innovative Product

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### Abstract:

The article deals with servitization, as one of the modern trends in the development of the economy, as a result of which changes occur in the market supply of organizations, their level of customer focus, organizational culture, requirements for the skills of the staff. The article analyzes the external and internal factors of the marketing environment, allowing assessing the potential of the industrial products market in the field of servitization. The role of communications in the formation of a marketing strategy on the innovative-industrial market with the identification of key advantages of achieving success based on service has revealed.

**Keywords:** servitization; competitive strategy; marketing of industrial products; customer focus; innovation; business model

**JEL Classification:** M31; O31; O32

### Introduction

Recently, the concepts of “services” and “service” have become key for business. World experience shows that it is not the goods that win in the competition; everything has decided by the services that allow you to firmly tie the client to you. Moreover, this applies not only to consumer, but also to industrial markets, which are gradually transformed from classical manufacturers into suppliers of integrated solutions that can satisfy all the wishes of customers. Therefore, to implement the new concept, significant changes are required: processes, technologies, strategies and business models, which should be completely revised from the point of view of the supplier of integrated solutions.

In the modern conditions of innovative development of the economy of Kazakhstan at the macro, meso and micro levels, marketing strategies for promoting innovative products become the center of concentration of scientific research and are an important part of the socio-economic area and a new element of the market management system of business entities that are subjects of the innovation and investment market, which produce and promote new innovative products to this market. More actively in the structure of marketing enterprises of innovative business are developing its new varieties, which are called “servitization”.

### 1. Research Background

The servitization of the economy, the transformation of services from an additional factor contributing to attracting customers and selling physical goods, into a factor in the formation of differentiating characteristics and competitive advantages, requires customer focus even from industrial companies (Agafonova and Aksenov 2016).

In this regard, the development of an effective marketing strategy for innovative enterprises of industrial business is a necessary condition for ensuring competitiveness and social responsibility of marketing innovative products and services in the innovation market. One of the top priorities for the development of innovative technology products, including innovative entrepreneurship and innovative industrial business, is to ensure the

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manageability of the process of intra-organizational innovation marketing based on the integration of the cluster approach factors into the system of value preferences of an economic entity (Artyomova 2013).

In the conditions of the modern market of Kazakhstan, with the growth of the number of competing organizations, the role and importance of marketing approaches in the organization and promotion of services to the market significantly increases. Given the current trends in the global market, the main task today for domestic producers is to invest today in the development of their own future production.

So, in the Message of the President of the Republic of Kazakhstan - Leader of the Nation N.A. Nazarbayev to the people of Kazakhstan. The strategy "Kazakhstan -2050" was noted "by 2050, Kazakhstan should completely renew its production assets in accordance with the latest technological standards. In the most competitive industries, we need to actively develop strategies for the formation of new market niches for domestic producers" (Nazarbayev 2017).

One of the main objectives of the implementation of the state industrial-innovative policy of Kazakhstan is the production of competitive and export-oriented goods and services at industrial enterprises and increase the efficiency of innovative activities. The formation and development of industry creates the basis of the infrastructure of the economy and plays a major role in improving the welfare of the nation (Kenzheguzin 2015).

The realization of the priorities related to the promotion of Kazakhstan as one of the most competitive and dynamically developing countries in the world is impossible without activating the role of entrepreneurship in all spheres of the economy. Analysis of publications and official documents devoted to the problems of strategic development of Kazakhstan, its successful integration into the world economy, modernization of the structure of the domestic economy and the formation of a socially-oriented society showed that the leadership of the country attached paramount importance to the development of entrepreneurial activity (Omarova 2017).

## 2. Methodology

In 2017 produced industrial products in current prices by 22,790.2 billion tenge, which compared to the level of 2016 amounted to 107.3% (Table 1).

Table 1. Volumes and indexes of industrial production

Region	Production volume in current prices, in million tenge	Industrial Production Index in % 2017 by 2016
Republic of Kazakhstan	22 790 209	107,3
Akmolinskaya	561 290	101,1
Aktyubinskaya	1 597 086	105,6
Almatinskaya	795 684	104,8
Atyrauskaya	5 508 219	121,2
Zapadno-Kazakhstanskaya	1 914 501	103,4
Zhambylskaya	374 029	103,6
Karagandinskaya	2 318 440	105,5
Kostanayskaya	764 326	105,4
KKyzylordinskaya	731 408	96,1
Mangistauskaya	2 316 201	100,9
Yuzhno-Kazakhstanskaya	832 114	104,3
Pavlodarskaya	1 778 386	106,5
Severo-Kazakhstanskaya	240 530	108,5
Vostochno-Kazakhstanskaya	1 581 530	100,7
Astana city	573 927	110,8
Almaty city	902 537	105,1

Source: compiled by authors

Volumes and indices of industrial production in the regional aspect indicate that the indicators in some regions have a slight increase, therefore, in case of increased use of innovative marketing in certain industrial sectors of the country, its results could be the stimulation of the general activity of local and regional industry, improving competitiveness individual large enterprises and industries, and the intensification of the processes of participation of Kazakhstan brands in the world preferential markets, in international spaces and others. In this regard, we consider servitization strategies at industrial enterprises, which are necessary in the new business environment for product promotion. Based on the materials of TOTAL Kazakhstan, we will consider a strategy that occupies an important place due to its rich energy potential and the excellent relations that have developed between the company and the government of the Republic of Kazakhstan.

Total Group is one of the largest oil and gas companies in the world, which is engaged in the development of fields, oil and gas production, various types of oil refining and synthesis, and produces a wide range of chemical products. The company's history is full of examples of innovative developments - from the integrated development of the Lac acid gas field in France to the introduction of underwater separation in the deepwater Pazflor field in Angola. Investing in such unique projects as the development of Kashagan, allows the company to maintain leading positions in the field of identifying and commissioning the most complex from a technical and technological point of view, oil and gas structures.

The most important task for the company in this project is to ensure stable production in conditions of industrial and environmental safety. In addition, expanding its opportunities for investment and business development, becoming the operator for exploration blocks "North" and "South". In the Aktobe region, TOTAL continues to strengthen its partnership with the national company KazMunaiGas, actively exploring the possibility of implementing joint geological exploration projects.

LLP Total MS Kazakhstan is the only company that does not sell through distributors, but directly sells to mining companies. The company's clients are such companies as: the KAZ Minerals group of companies, KATSO (AREVA), EuroChem Fertilizers, as well as Zhambyl cement price companies, Heidelberg Cent and others.

TOTAL Group is one of the largest oil and gas companies in the world, which develops fields, extracts oil and gas, various types of oil refining and synthesis, and produces a wide range of chemical products. Total is actively developing the use of environmentally friendly forms of energy: solar energy and biofuels; creates fuel-efficient and biodegradable products.

The market of the activity of LLP "Tarkal Sekting Services Kazakstan" is a variety of the commodity market, has specific features, which leads to a special approach to the management of enterprises in the service sector. One of the most important properties of competitiveness is the ability to influence it, that is, it is possible and necessary to manage it. Managing the competitiveness of the company - management in the market conditions of their competitive advantages. Improving the competitiveness of LLP "Tarkal Sketches Särvice Kazakhstan" has implemented through management mechanisms, which can be defined as a set of resources, methods, tools, tools and levers of influence on market processes applied by the governing bodies of all hierarchical levels to achieve the economic development element of the economic system.

LLP "Total Marketing Services Kazakhstan" has a diversified business portfolio of orders, including exploration and production, processing, marketing and sale. It is important to note that the key factors determining success in industry competition are: high quality sales organization, the creation of new products that meet global market trends, the expansion of the product line and effective cost management.

Now, LLP "Total Marketing Services Kazakhstan" is operating in one of the strategic sectors of importance for the state - in the industrial-oil sector. The key factor of the Company's activity is the versatility of the services provided. The range of services provided has aimed at comprehensive service support of industrial enterprises and has focused in three main areas: Comprehensive-service - Comprehensive service includes multidisciplinary services with technical equipment capable of serving industrial facilities at a high level; LLP "Total Marketing Services Kazakhstan" has an extensive fleet of vehicles, which includes types of passenger transport and special equipment.

To achieve its goals, the Company conducted a complete census of outlets. The census was carried out with the help of detailed maps of cities divided into separate sections and special questionnaires with the help of which information was collected from outlets. We can show the penetration index of Total and Elf grades in rewritten Total and Elf retail outlets, which has shown in Table 2.

Table 2. The index of penetration brands Total and Elf for 2017

Region	Total	Elf
Aktobe	88%	79%
Astana	85%	88%
Taldikorgan	73%	76%
Kyzylorda	63%	43%
Shymkent	59%	44%
Kokshetau	53%	26%
Atyrau	52%	72%
Uralsk	47%	55%
Semey	36%	16%
Pavlodar	35%	30%
Almaty	33%	32%



Region	Total	Elf
Karaganda	32%	31%
Ust'-Kamenogorsk	28%	28%
Petropavlovsk	20%	27%
Taraz	18%	15%
Aktau	4%	25%
Kostanay	3%	6%

Source: compiled by authors

### 3. Application functionality

If we take into account the penetration index, then according to the Shell brand, you can see the graph from 2013 to 2017 and make a forecast for this year, taking into account Figure 1 (Magnus and Katyshev 2014).

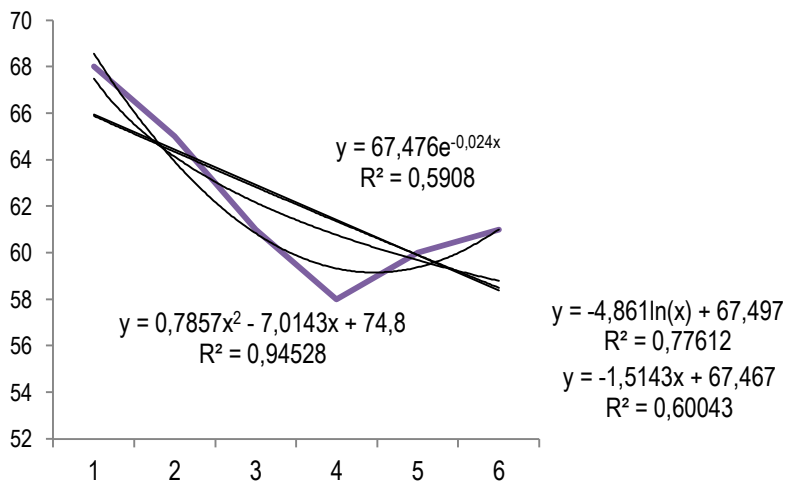
Since the correlation index is greater for a parabolic function, *i.e.* in this case, the connection will be closer, then for the forecast, we will take the equation:

$$y_t = 0,786 t^2 - 7,014 \cdot t + 74,8$$

Shell penetration index in 2018 will be equal to:

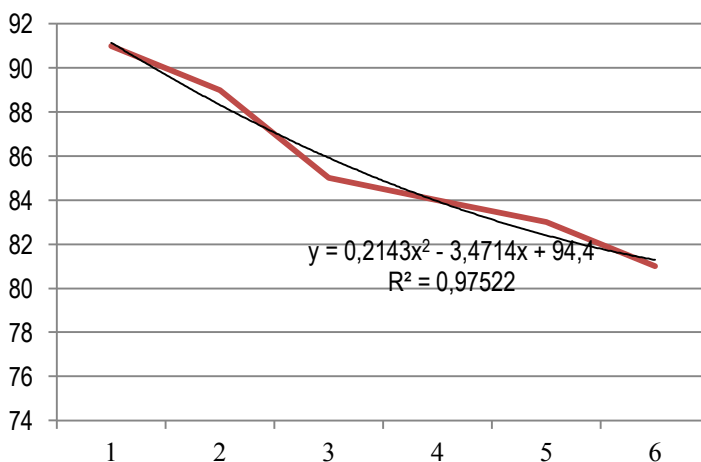
$$y_t = 0,786 \cdot 7^2 - 7,014 \cdot 7 + 74,8 \approx 64\%$$

Figure 1. Analysis of the penetration index at Shell from 2013 to 2017, in %



Now let's look at the prediction of the penetration index by the Mobil brand for 2018, for this we compose the regression equations and choose the equation for which the correlation index is greater, then we get Figure 2.

Figure 2. Analysis of the penetration index of Mobil from 2013 to 2017, in %



The penetration index for Mobil in 2018 will be equal to:

$$y_t = 0,214 \cdot 7^2 - 3,471 \cdot 7 + 94,4 \approx 81\%$$

Similarly, we look at the brands Total and Castrol, see Figures 3 and 4.

Figure 3. Analysis of the penetration index of Mobill from 2013 to 2017, in %

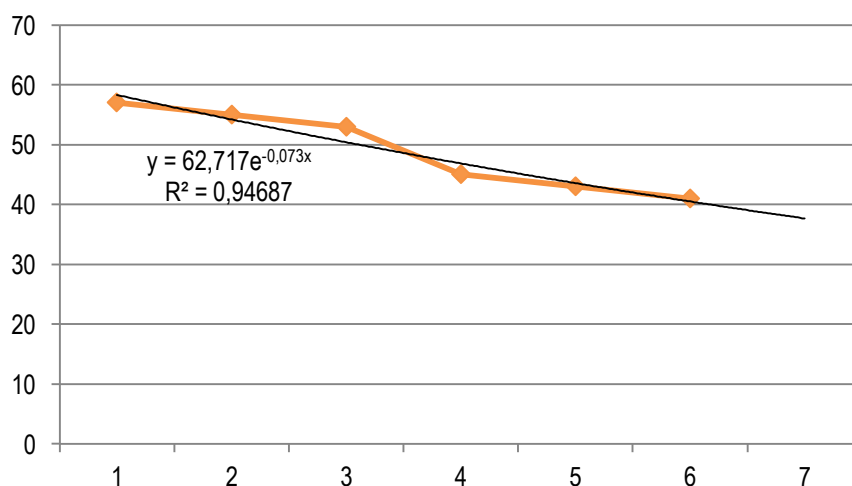
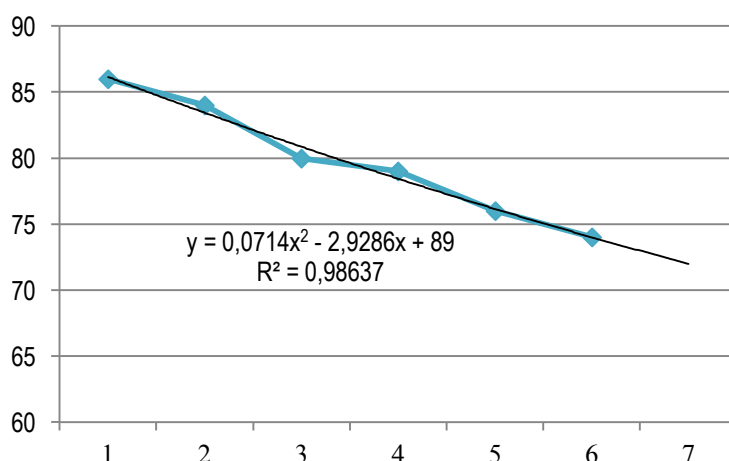


Figure 4. Analysis of Castrol's penetration index from 2013 to 2017, in %



Total penetration index (the highest index of correlation of the exponential function) in 2018 will be equal to:

$$y_t = 62,717 \cdot e^{-0,073 \cdot 7} \approx 38\%$$

The Castrol penetration index (the highest index of the correlation index for a parabolic function) in 2018 will be equal to:

$$y_t = 0,071 \cdot 7^2 - 2,929 \cdot 7 + 89 \approx 72\%$$

Taking into account Figures 1- 4 the following conclusion can be made according to the forecast for 2018:

- at Shell brand is 64%, i.e. an increase of 3% and 4% compared with the figures for 2017 and 2016;
- on the Mobill brand is equal to 81%, with the previous year the figure has not changed, and in comparison with the indicator of 2016, here we already see a decrease of 2%;
- total brand is 38%, i.e. a decrease of 3% and 5% compared with the figures for 2017 and 2016;
- Castrol brand is 72%, i.e. a decrease of 2% and 4% compared with the figures for 2017 and 2016 (Sedelev 2017).

Then we get the change in the penetration index of 4 grades from 2012 to 2018, see Table 3.

Table 3. Analysis of the penetration index, taking into account the forecast for 2018

Model	2012	2018
Shell	68%	64%
Mobill	91%	81%
Total	57%	38%
Castrol	86%	72%

Source: compiled by authors

The penetration index for 4 major brands decreased by an average of 12%, with the greatest drop being observed in the Total brand (-19%), and the smallest in Shell (-4%).

TOTAL collaborates with equipment manufacturers to create high-tech media for optimal performance and protection of mining equipment and increases the range of energy-saving lubricants thanks to modern developments. LLP Total Marketing Services Kazakhstan continues to develop, striving to take a stable place as one of the best service companies providing service maintenance to the industrial sector, by increasing the development rates required for market entry into the construction and maintenance of technological equipment of production and industrial enterprises.

Every year the market increases its industrial output and has a growing trend. In this huge industrial complex, the company intends to consolidate its positions and will make every effort to maintain fair pricing, taking into account real investment in capital by the industrial sector. Depending on the changes in the markets and in the financial position of the Company, the implementation of the development strategy of LLP "Total Marketing Services Kazakhstan" will occur in two stages:

1) until the end of 2018, the Company will focus on reducing the cost of services provided and improving the efficiency of the LLP "Total Marketing Services Kazakhstan". Optimization of networks of suppliers of raw materials and the establishment of partnerships are also components of the first stage;

2) after 2018, it provides for active measures to increase the share of its presence in the market of Almaty and Pavlodar regions and increase the image side of the Company. The company will actively introduce customer-oriented business principles, develop a range of services and flexible pricing to promote an innovative product in the industrial market of Kazakhstan due to:

- IT services - development, implementation and maintenance, IT consulting;
- engineering services - design and preparation of technical documentation;
- analysis of massive data - online data transfer;
- telematic services - online data transmission, fleet management, remote data analysis and monitoring.

In both stages, along with the execution of the events, an investment program will be implemented to improve the material base and technical equipment of LLP "Total Marketing Services Kazakhstan". Successful implementation of the strategy will allow turning LLP "Total Marketing Services Kazakhstan" into a highly efficient commercial organization that provides high-quality technical services with a low level of prime cost of services.

In particular, the following changes are expected:

- instead of resource-intensive infrastructure there will be a highly efficient energy and resource-saving structure of the Company.
- customer base will be diversified. Instead of one main partner, there will be increased and diversified cooperation with enterprises with large annual turnover.
- instead of the leased production capacity, its own powerful material base will appear.
- instead of a little-known enterprise, an image Company will appear under its brand name.

Based on the above, we can conclude that the implementation of marketing strategies aimed at promoting products, in particular, industrial products, as well as when calculating the level of competitiveness of an enterprise, it is necessary to take into account the differentiation of products (goods, works, services) and market segments in which these products are subsequently sold (goods, work, services) by competing economic entities.

Strategic management assumes that to create a sustainable competitive advantage means to offer greater perceived value to consumers and other interested parties. These advantages can be associated with both the characteristics of the services and goods produced, as well as with the characteristics of the enterprise itself and its position in the market (Oliva and Kallenberg 2013).

## Conclusion

The most important areas for achieving a qualitatively new level of competitiveness and export potential of the economy of the Republic of Kazakhstan are defined in the messages of the President of the Republic of Kazakhstan

N. Nazarbayev. the people of Kazakhstan. This is due to the fact that the state's competitiveness is a matter of principle for the development of any country, since it is the only objective measure of the quality of life and the well-being of the population.

Drawing up a methodology for assessing the effectiveness of the marketing activity of an enterprise comes down to setting research objectives, in which these methods will be used, for which it is necessary to define research objectives, which will narrow the range of research objects and, consequently, reduce the costs of conducting research (Kanabekova 2012).

To develop a strategy, a large amount of information is needed from various sources and on a wide variety of processes, both in the external environment of the organization and in the organizational systems. At the same time, it is possible to use machine information processing and automated control systems more widely.

Modern organizations exist in conditions of a constant change in the external environment: the accelerating globalization leads to the internationalization of business and the intensification of intercultural interaction. This process is accompanied by the strengthening of such an internal factor of development as the servitization of the economy, that is, the transformation of many internal procedures into acts of providing services. In order to meet the demands of a growing international clientele and remain competitive, companies are forced to improve their business strategy, paying increasing attention to the service component of the business, while customizing their offers.

Servicing is of interest to industrial companies right now, because the growth in the volume of new product sales may slow down, and then expanding the range of services offered becomes an attractive way to increase revenue (Khrutsky and Korneev 2012).

In order to stand out from the sea of the same manufacturers and distributors, it is increasingly necessary to apply to the offer of additional services. The threat of commoditization and the reduction of profits has led to the fact that manufacturers are forced to act to protect their market share in the face of global competition and the threat of brand differentiation. "Servicing" helps a company turn services into revenue and increase its value. In recent years, a production-oriented strategy has ceased to be a competitive advantage - this is the standard. Therefore, many companies are reorienting from cleaner production to the provision of additional services. It is not the product itself that comes to the forefront, but its effective operation throughout the entire life cycle, as well as the offer of additional services demanded by picky customers. All more and more manufacturers compete with a portfolio of integrated products and services. This is an explicit and conscious strategy for manufacturers, aimed at providing product-oriented services, which are a major factor in market differentiation (Saginova 2017).

During the implementation of the marketing strategy, it is important, on the one hand, to try to adhere to the original plan and at the same time show some flexibility if changes in the external environment dictate the need for its adjustment. Monitoring a marketing strategy involves evaluating its results, comparing them with targets, and choosing corrective actions to correct ineffective or improving a successful strategy.

The modern concept of marketing strategy of industrial companies is that all activities of the enterprise are based on knowledge of consumer demand and its changes in perspective. Moreover, one of the goals of marketing is to identify unmet customer inquiries in order to focus production on meeting these requests. In the struggle for the company's customers, they are becoming increasingly embedded in their daily lives. They offer a comprehensive service, the ability to perform operations related to the proposed product, without leaving the office or from home. The company attracts consumers, preserving, and often increasing, sales, and at the same time rigidly ties customers to itself. In fact, the sales object is no longer a product, but a system solution aimed at fully satisfying the customer's needs. That is why marketing as a set of established methods of studying markets, among other things, still directs its efforts to create effective sales channels and conduct comprehensive advertising campaigns.

Heads of modern enterprises of the Republic of Kazakhstan need not only to study the concept of marketing, but also to be able to use it, this is how it is possible to achieve an increase in the effectiveness of the marketing activity of an enterprise. Experts say that in the field of production we are waiting for a fundamental transformation or even a new industrial revolution. In the new business models of companies, the boundary between the product and the service is blurred - this is about "product bundled with services". For manufacturers, this means rethinking the processes of development, production, promotion, maintenance, etc.

Although servitization is already recognized as a successful strategy for creating a sustainable competitive advantage, the transition to this strategy is fraught with a number of difficulties:

- *first*, the economic benefits of servitization are not obvious, so the transition requires the company to work both in the external and in the internal environment;

- *secondly*, even realizing the benefits of this strategy, companies do not always have the necessary skills to implement the transition;
- *thirdly*, by adopting servitization as a strategy, a company may fail in its implementation (Epstein 2015).

Overcoming these obstacles requires significant changes in two directions: changing the culture of the organization and teaching its employees new skills and abilities, focused on external and internal cooperation. To develop and offer an organization to the market for servitization, a free exchange and inflow of information is needed: the availability of appropriate systems to guarantee the necessary expertise in the network of partners of the organization, and ensuring the accumulation and exchange of knowledge and experience.

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\*\*\* Data of LLP “Total Marketing Services Kazakhstan”.

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## Formation and Development of the Dairy Market and its Economic Efficiency in North Kazakhstan (Akmolinsky Region)

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### Abstract:

The urgency of the problem is caused by the difficult situation in the economy, changes in the international situation, the need to introduce new approaches that will ensure quality growth in the agro-industrial sectors, including the dairy sector. The leading methods of research of this problem are the analysis of theoretical sources, statistical analysis, comparison. This article presents the main approaches to the concept of the dairy market, determines the factors for its development, analyzes the formation and development of the dairy market and its economic efficiency in North Kazakhstan (by the example of the Akmolinsky region). To meet the needs of the population of Akmolinsky region with competitive dairy products and increase export potential, it is necessary to carry out a radical technical reconstruction of enterprises with the establishment of advanced technological equipment and the introduction of additional capacities for the production of dairy products. The materials of the article are of practical value for the development of the dairy market at the regional level (at the level of the Akmolinsky region or at the regional level in other countries), for making decisions related to meeting the needs of the Akmolinsky region population and Kazakhstan.

**Keywords:** dairy products; dairy products market; dairy industry; economic efficiency; production of dairy products

**JEL Classification:** L11; L15; L16; L66

### Introduction

Dairy animal breeding and dairy industry are one of the most important subsystems of the agro-industrial complex of the Republic of Kazakhstan. Milk and dairy products bring a variety in nutrition, improve taste, increase the nutritional value of food and have a huge dietary and curative value (Aleksandrova 2014). Milk and dairy products are rich in proteins, essential amino acids, microelements, vitamins and other useful substances (Zavgorodnia 2010).

The dairy industry is one of the most efficient branches of the economy in most countries of the world. In Kazakhstan in general and in the Akmolinsky region in particular, its development is complicated by the imperfection of the economic mechanism and inefficient state regulation, as well as by many factors, among which the limited raw material, financial resources and consumer demand have the greatest impact. A limited amount of milk in the country encourages producers to reduce the use of raw materials in finished products and introduce new products



that help reduce the use of milk. The development of the dairy market is hampered by the quality problem of milk and dairy products; despite the high demand, it is one of the main and painful problems of the industry, which should be given special attention. The problem is mainly related to the non-observance of technological discipline in the production of products, in the control of products in terms of safety indicators, in carrying out mandatory work on state certification of products (unsatisfactory labeling, production with a violation of the formulation, non-compliance of products with physical and chemical indices) (Barbosa *et al.* 2015).

At the present stage of development, the main task for milk processing enterprises is the production of competitive products, which are not inferior to imports in terms of quality and price. Today, milk and dairy products are defined as a social product (after bakery products), so it is necessary to provide the population of the domestic market with dairy products quantitatively, and to guarantee the consumer the proper quality and safety. The prospects for the development of the dairy industry to a large extent depend on the possibilities of developing the raw materials base and the trends in the development of demand for dairy products.

Theoretical significance of the work is to identify the essential and meaningful characteristics of the dairy market. The practical importance of the work is to develop specific recommendations for the development of the dairy market in the Akmolinsky region, which can be submitted to the authorities for effective use. The fundamental developments on the problem studied, presented in the works of domestic and foreign authors became the theoretical basis of the work.

Many authors consider the problems and suggest ways to develop the dairy market. For example, M. M. Nurpeisova believes that the non-competitiveness of dairy products, especially milk-intensive, is explained by the low level of dairy farming in the country: the irrational structure of the dairy herd with a predominance in private household plots, low animal productivity (two times lower than in Belarus), and a shortage of raw materials. In her opinion, one of the ways to solve the deficit reduction is to create own farms, or to develop holding structures with a single chain "from the field to the fork" (Nurpeisova 2016).

In the opinion of K.R. Nurmaganbetov and K.K. Nurmaganbetov (2014), the low level of industrial processing of agricultural raw materials is a restraining factor in the development of food production in Kazakhstan, which is due both to the level of technical and technological provision of the food industry and the quality of raw material supplies. However, in the literature there are no actual studies of the problems of formation and development of the dairy market in North Kazakhstan (in the Akmolinsky region), which will be disclosed in this article.

## 1. Literature Review

At the beginning of the XXI century, the problem of food security became one of the most important challenges of planetary importance. In this regards, the development of the market for milk and dairy products, due to the indispensability of its products in human life has the priority. Due to this, a lot of scientific research has been devoted to the development of the dairy market.

Let us consider the concepts of the market, dairy products market, dairy products subcomplex. From the point of view of Shamenkova (2012), the market is a complex entity that represents, on one hand, a set of purchase and sale processes that perform price balancing, and on the other hand, provides a link between production and consumption. According to Smertina (2014), the market for milk and dairy products is an important part of the food market in Kazakhstan. It has a significant role in solving the food problem, determining the supply and cost of the main types of dairy products and forming competitive positions of participants in food markets. According to the author, the market of milk and dairy products is a system of commodity-money relations between economically isolated producers of food raw materials, processors and consumers, which covers the whole social reproduction process, including production, distribution, exchange and consumption with the aim of daily supply of the most important foodstuffs and receiving (expected) income by all market operators.

Stolyarova and Stolyarova (2017) understand the set of enterprises that produce raw milk and process it into socially significant dairy products of a wide range under the dairy product subcomplex. Nurakhova (2016) notes that the market for milk and dairy products has special characteristics. Among them: dairy products are perishable produce, the seasonal nature of milk production (in order to meet the demand in winter it is necessary to form stocks of milk powder and other dairy products, *etc.*)

Much attention in research is given to the formation of demand and supply in the dairy market, factors affecting demand. For example, Smertina (2014) believes that the demand for dairy products is affected by the number and age composition of the population, national traditions, consumer tastes, the level of per capita consumption, the level of incomes of the population and the relative weight of spending on food in consumer incomes, the prevailing level of prices, as a result of state regulation of the agrarian market.

Artemova, Kryemianskaya and Kurnyakova (2016) believe that the demand for milk, as a product of first necessity, does not decrease with the growth of prices for it, regardless of the political and economic situation. According to Kovalev (2016), the development of production and marketing of dairy products is influenced by the achievement of supply and demand balance. Potential market capacity is affected by the number of consumers and the level of saturation of local markets with dairy products.

Cheprakov and Avrutskaya (2016) believe that a number of factors affect the activity of enterprises engaged in the dairy products production. The first and most significant is the dependence of the industry on the suppliers of raw materials, which, in turn, is determined by the specifics and the current state of the livestock sector. The production of dairy products in itself is capital intensive, investments have long payback periods, and that leads to an increase in the planning horizon and makes it long-term (Akhmetshin *et al.* 2017).

The necessary conditions for the development of the dairy industry are the following: low cost of fodder production, high genetic potential of animals and maintenance of maintenance technology, availability of sales markets (Karimov 2016). The increase in labor productivity in dairy animal breeding is a complex and multifaceted process affecting various aspects of production activity, including state regulation, scientific and technological progress, material incentives for industry workers (Kirdischeva and Kirdischev 2016).

Among the factors influencing the demand in the market of milk and dairy products, there are four groups: organizational-economic, socio-economic, psychological and foreign trade (Sevasteyeva 2013).

We can include the assortment of dairy products, the quality of goods, advertising and the sales season in the first group of factors. These factors have a different impact on demand within the urban agglomeration market and the rural market. So, in meeting the needs of the dairy products of the city's population, the assortment, its variety, and constant renovation are of great importance. In the rural market, the diversity of the product line is not given paramount importance, because of the greater conservatism of tastes, and in the rural market, advertising has less impact on demand compared to the city market.

Socio-economic factors include: the number and incomes of consumers, whose level in the city is much higher than the level of incomes in rural areas. This group also includes: changing the number of consumers, changing their incomes, changing economic policies. The socio-demographic indicators of the city and village are seriously different.

The third group of factors is psychological: the tastes and expectations of consumers, the usefulness of the product, the culture of nutrition. Tastes of consumers and the culture of consumption are preferences and beliefs in consumer values and norms; it is the attitude of a person to a product and its properties, which ultimately forms consumer habits of the population. The rural population prefers traditional dairy products, such as sour cream, milk, kefir, while city dwellers choose dietary dairy products, products using various additives, yoghurts, cheeses, *etc.*

The group of foreign trade factors includes the change in the price of the goods, the change in assortment. Consumers at different subspecies of the milk and dairy products market react differently to changes in these factors. Thus, the growth in prices for dairy products adversely affects demand, primarily in the rural market, since the level of incomes of rural residents is lower than that of the city's population, so the elasticity of the product is higher here. The effect of such a factor as the change in assortment on these subspecies of the dairy market has the greatest influence on the urban market. There is a direct relationship between the variety of products offered, the number of new products and the level of demand for it. In the rural market of dairy products, due to the preference of traditional products among the population, as well as the possibility of purchasing natural dairy products that have not undergone profound processing, the lack of a wide variety of products in retail outlets will have a minimal effect on consumer demand.

There are five groups of factors that affect the supply of milk and dairy products: socio-economic factors, political, foreign trade, organizational, economic and resource.

The group of socio-economic factors includes the availability of demand, a change in prices for competing products, entry of new firms to the market. Producers in the rural market for milk and dairy products are influenced by these factors due to the fact that there are mainly small processing organizations working there that are less adapted to changing business conditions, are less competitive in the market than large processing organizations in the city market.

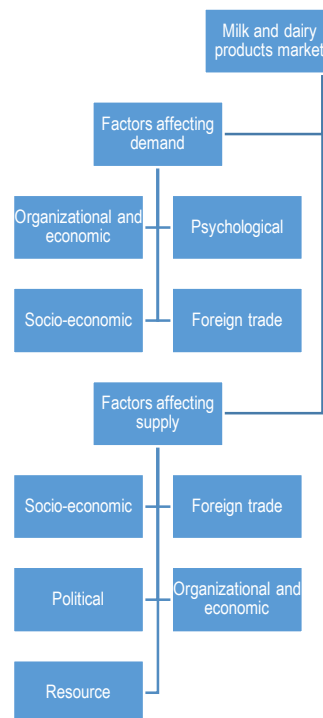
Political factors include the country's politics and economy. They have a greater impact on the city market producers, which is explained by the greater involvement of large enterprises in the management of international, interregional business, which makes such dairy producers dependent on the prices of raw material importers, and hence on the country's foreign and domestic policies. The political factors affecting the supply of dairy products and foreign trade are closely related (changes in the price of products, changes in the range of dairy products), so the level of influence of these factors is higher in the dairy market in the city.

The fourth group of factors includes: the price of the product, the change in production costs and the level of revenue from the sale of goods.

The fifth group of factors includes labor, money and material resources, capacities, transport infrastructure. The influence of the factors of this group on the development of supply is very significant. The presence of industries that provide production, delivery, exchange, sale of finished products, contributes to the effective development of the market for milk and dairy products. In the market of milk and dairy products of the city the infrastructure is developed to a greater extent than on the rural one, and this is the reason for the concentration of processing capacities near the regional center (Silagadze 2017).

The definition of factors affecting the supply and demand of milk and dairy products in the regional market is of a strategic nature. Factors affecting supply and demand in the milk and dairy market are shown in Figure 1. In the opinion of Maslyukovskaya (2014), the most important variables characterizing consumers of dairy products are the level of income, age, sex, habitat, diet, way of life. By the income criterion, four segments are distinguished, the characteristics of which are given in Table 1.

Figure 1. Factors affecting supply and demand in the milk and dairy market



Source: compiled by the authors on the basis of the article by Sevasteyeva (2013)

Workers with families are the target segment of most dairy plants. Low-income consumers are not an oriented segment for dairy producers, but they should not be neglected, and many milk processors understand this and produce products in economical packages and bags (for example, milk, sour cream and the like). There is a lot of competition regarding the coverage of the middle class, therefore marketing activities to win this market or to exist on it are actively being developed. The last segment – high-income consumers – is the most attractive for producers, but so far small in volume. These are goods of the highest price category, targeted at consumers with a high level of income, who prefer the quality of goods relative to its price.

Table 1. Segmentation of consumers of dairy products

Segment name	Segment composition	Peculiarities of consumption
Low-income consumers	Unemployed (registered and unregistered), pensioners, invalids, students, rural population that maintains subsidiary farming	This group of consumers buys basic cheap dairy products – milk, sour cream, sometimes cottage cheese. The main factor that influences the decision to purchase a product is price, which is why such consumers buy products in spontaneous markets and it is quite hard to trace their demand
Workers with families	Employees of various industries with families	Representatives of this segment differ in terms of income and requirements for goods. Basically, they buy medium-quality

Segment name	Segment composition	Peculiarities of consumption
		products, react to prices, often prefer shopping in stores and supermarkets to spontaneous markets and bazaars
Middle class	Specialists of various industries, small businessmen	Consumers of this segment place high demands on dairy products, pay attention to quality, expiry date, product composition. The culture of consumption differs little from traditional, although these buyers are more product-oriented, expect high quality and variety of goods, are less vulnerable to price
High-income consumers	Senior staff with families	This group of consumers takes into account the quality, taste, brand, the price is not a determining factor for them

Source: compiled by the authors on the basis of the article by Maslyukovskaya (2014).

When segmenting consumers, it is important to assess them according to age and education. Young people and older consumers are significantly different in their consumption patterns: if the former prefer new products and exotic tastes, older people usually buy traditional goods in soft packaging. There is a growing trend in the number of supporters of a healthy lifestyle.

Another way of segmenting the dairy market is to determine the motivation for making a purchase. All the needs of dairy products' consumers are divided into rational and emotional. The rational requirements include, for example, the purchase of a dairy product as a source of protein, calcium, a way to regulate acidity, and also as a product that is suitable for the whole family and is easily digested. Examples of emotional needs of consumers of dairy products: improving the mood (one's or another person), a way to calm the child, spending time in the circle of close people, a "delicious" start of the day.

Complex analysis of consumers on such factors as income level, peculiarities of consumer behavior is carried out in the process of segmenting the dairy market by the way of life. Here the following groups of consumers of dairy products are distinguished:

- Traditionalists – people with established consumer habits, who mostly buy traditional dairy products (milk, kefir, sour cream, boiled fermented milk, lactic cheese), prefer cooking their own. They buy goods with a taste that is close to home products; they often buy goods in spontaneous markets.
- Consumers who are sensitive to the level of prices – usually older people with low incomes, as well as unemployed, students, part of the rural population.
- The price is the determining factor when buying for representatives of this segment. The choice is made in favor of goods in the lower price segments.
- "Doctors" – buy fresh and healthy products, pay attention to the composition and shelf life. These consumers are primarily affected by advertising on the recommendation of a professional doctor to use this product. The average level of sensitivity to price.
- "Conformists" – consumers, the main criterion for choosing is convenience in the use of the product. They, as a rule, do not prepare independently, therefore they buy ready-made or almost ready-made products. These are people with an active lifestyle, young people, representatives of the business community.
- "Intellectuals" – consumers with a high level of income, who buy only quality products of well-known manufacturers and brands, do not save on food.
- Mixed type – this group includes consumers who did not belong to the previous groups. The characteristics of each of the segments examined are traced in their consumer behavior, but they are not so pronounced. This group includes consumers, who move from one segment to another.

The choice of criterion for consumer analysis depends, first of all, on the objectives pursued by the company in this market situation, as well as on the availability and cost of the information necessary for segmentation.

## 2. Materials and Methods

The main method that can be used in analyzing the development of the dairy market and its economic efficiency in North Kazakhstan (in the Akmolinsky region) is statistical analysis. In Kazakhstan, the Committee on Statistics of the Republic of Kazakhstan is a service that is responsible for the collection and publication of statistical data in open sources, including by region. To analyze the indicators characterizing the development of the dairy market, the author selected:

- indicators of dairy products production in Akmolinsky region and the RK;
- dynamics of milk production in the Akmolinsky region and the RK;
- structure of annual milk production in Akmolinsky region;
- dynamics of commodity production of raw cow milk in the Akmolinsky region and the RK;

- dynamics of milk sales in Akmolinsky region;
- structure of production consumption of milk in the RK;
- structure of the volume of milk processed for food purposes in Kazakhstan;
- statistics of the number of cows in the Akmolinsky region;
- average milk yield per one milch cow in the Akmolinsky region;
- comparison of average milk yields per milk cow in the Akmolinsky region and in Kazakhstan.

At the same time, these indicators should be investigated in dynamics over several years.

The data on the dairy market of Kazakhstan, Akmolinsky region as the main subject of the study, and several other regions for comparative analysis are chosen as the empirical base of the research: Pavlodarsky, North Kazakhstan, Karagandinsky, Kostanaysky regions as being in the immediate vicinity of the Akmolinsky region. It is important to characterize the Akmolinsky region itself. This is an area in North Kazakhstan. The enclave, surrounded by the territory of the region, is Astana, the capital of Kazakhstan, which is not administratively included in the region. For Akmolinsky region as the main supplier of agricultural products, the primary task is to provide food products to the residents of Astana in full and appropriate quality. The administrative center of the region since 1999 is the city of Kokshetau. Akmolinsky region is an agricultural and industrial region. It was established in 1939. As part of the region there are 2 cities of regional significance: Kokshetau and Stepnogorsk, 8 cities of regional subordination, 17 districts. Territory – 146.2 thousand square kilometers or 5.4% of the territory of the republic. The population as of 01.10.2015 is 742.4 thousand people. The population of the region (as well as of the whole of Kazakhstan) is increasing every year for several years. The study of the problem was carried out in three stages:

- *at the first stage*, a theoretical analysis of existing methodological approaches to the analysis of the dairy market development and its economic efficiency in North Kazakhstan (by the example of the Akmolinsky region), selected regions for comparison, statistical indicators for analysis;
- *at the second stage*, the selected indicators were studied, compared in dynamics (2015-2017) between the Akmolinsky region and other regions under study;
- *at the third stage*, general conclusions were drawn regarding the development of the dairy market and its economic efficiency in North Kazakhstan (by the example of the Akmolinsky region), and proposals were made to improve the management of the dairy market with a view to its development.

### 3. Results

The dairy industry is one of the leading branches of the food industry of the Republic of Kazakhstan. The development of dairy production, as well as of agriculture as a whole, is based in Kazakhstan on the support of various strategic state development programs. The most important of these are: "Kazakhstan-2050" Strategy, the Strategic Plan for the Development of the Republic of Kazakhstan to 2020, the Agro-Industrial Development Program of the Republic of Kazakhstan for 2013-2020, "Agrobusiness 2020" (Karimov 2016).

The main milk producers in Kazakhstan are 4 regions, 75% of milk processed and cream production is provided by milk producers in North Kazakhstan, Almaty, Kostanaysky and Akmolinsky regions. Analysis of the production of dairy products in the Akmolinsky region and the Republic of Kazakhstan is presented in Table 2.

Table 2. Analysis of the production of dairy products in the Akmolinsky region and the Republic of Kazakhstan for 2015-2017

Indicator	2015	2016	2017	Abs.chan. 2017 to 2015	Growth rate 2017 to 2015
Volume of products in general in the Republic of Kazakhstan, mln.tg	14,634,477	18,559,213	22,659,003	8,024,526	54.8
Produced in Akmolinsky region, mln. tg	313,475	420,685	545,507	232,032	74.0
Production of dairy products in the Republic of Kazakhstan, mln.tg	184,009	211,665	24,0174	56,165	30.5
Production of dairy products in Akmolinsky region, mln. Tg	13,568	18,306	13,986	417	3.1
The share of production of dairy prod. on the region in the total volume of production of dairy prod. in the RK,%	1.3	1.1	1.1	-0.2	-15.7
The share of production of dairy prod. on the region in the total output in Akm. area,%	4.3	4.4	2.6	-2	-40.8

Source: compiled by the author on the basis of the materials of the Committee on Statistics of the Republic of Kazakhstan



At the end of 2017, the production of dairy products in the Akmolinsky region reached 545507 million tenge in value terms. The positive dynamics of 2017 continues the trend of 2016 for growth in the industry. In general, the growth in the production of dairy products has also been noted in Kazakhstan. The production of dairy products, as well as the whole food industry, is included in the priority sectors of economic development. The state provides cost subsidies and concessional lending to enterprises in the sector, for example, through the KazAgro NMH as part of the State Program for the Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2017-2021, as well as through the Baiterek NMH and its subsidiary – Damu Fund in within the framework of SPIID.

The share of production of dairy products in the region in the total volume of production of dairy products in Kazakhstan decreased by 0.2 p.p. in 3 years, the share of production of dairy products by region in the total output in the Akmolinsky region decreased by 2 p.p. Dynamics of milk yield is presented in Table 3.

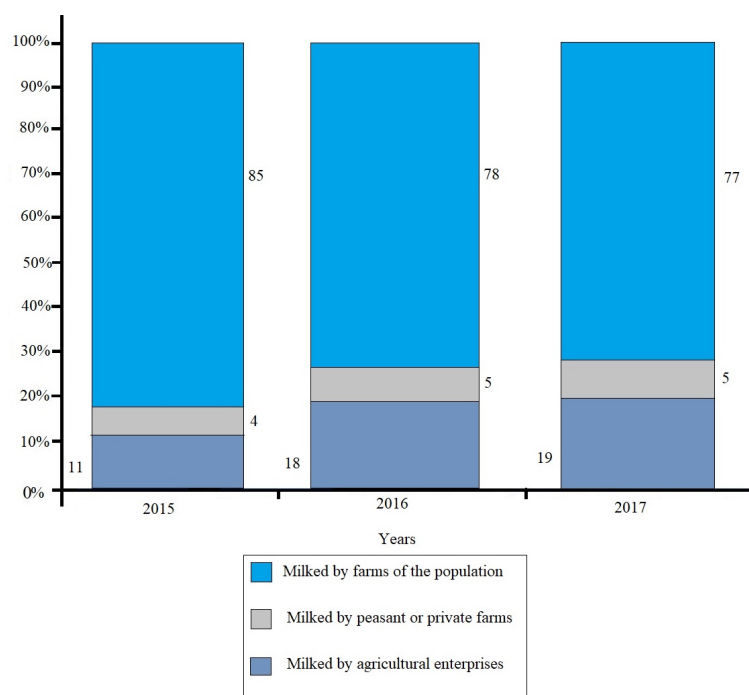
Table 3. Dynamics of milk production in the Akmolinsky region and the Republic of Kazakhstan for 2015-2017

Indicator	2015	2016	2017	Abs.chan. 2017 to 2015	Growth rate 2017 to 2015
Annual milk yield in the region, thousand tons	359.0	377.0	383.8	24.8	6.9
Annual milk yield in the RK, thousand tons	5 141.6	5 300.0	5 459.4	317.8	6.2
Specific weight of the indicator by region in the total value for the republic, %	6.98	7.11	7.03	0.05	0.69

Source: compiled by the author on the basis of the materials of the Committee on Statistics of the Republic of Kazakhstan

Annually, the annual milk yield is increased, both in the region and in general across Kazakhstan. The share of the indicator in the region in the overall value for the republic increased in 2016 and decreased in 2017, which means an increase in the specific milking of other regions of the republic. The structure of annual milk yield in the Akmolinsky region is shown in Figure 2.

Figure 2. Structure of annual milk yield in Akmolinsky region in 2015 - 2017, %



Source: compiled by the authors on the basis of the materials of the Committee on Statistics of the Republic of Kazakhstan

In order to load the production capacities of the existing milk processing enterprises, work is carried out to organize the purchase of milk from the population. 77-85% of milk, milked in Akmolinsky region – production of personal subsidiary plots. The dynamics of commodity production of raw cow milk in the Akmolinsky region and the Republic of Kazakhstan is presented in Table 4.



Table 4. Dynamics of commodity production of raw cow milk in Akmolinsky region and the RK for 2015-2017

Indicator	2015	2016	2017	Abs.chan. 2017 to 2015	Growth rate 2017 to 2015
<b>In Kazakhstan</b>					
Produced by all categories of farms, thousand tons	3,561.6	3,678.3	3,802.1	240.5	6.8
Produced by agricultural enterprises, thousand tons	235.9	286.4	323.5	87.6	37.1
Produced by peasant or private farms, thousand tons	407.3	438.3	526.7	119.3	29.3
Produced by households, thousand tons	2,918.3	2,953.6	2,952.0	33.6	1.2
<b>In the Akmolinsky region</b>					
Produced by all categories of farms, thousand tons	297.3	316.1	323.9	26.7	9.0
Produced by agricultural enterprises, thousand tons	38.5	62.4	67.8	29.3	76.1
Produced by peasant or private farms, thousand tons	9.5	11.9	12.7	3.1	33.0
Produced by households, thousand tons	249.3	241.7	243.5	-5.8	-2.3
<b>Specific weight of indicators by region in total cow milk production in Kazakhstan</b>					
Share of region in total production of raw cow milk,%	8.3	8.6	8.5	0.2	2.1
Share of region in the total output of agricultural enterprises,%	16.3	21.8	20.9	4.6	28.4
Share of region in the total production of peasant or private farms,%	2.3	2.7	2.4	0.1	2.8
Share of region in total production of households,%	8.5	8.2	8.2	-0.3	-3.4

Source: compiled by the authors on the basis of the materials of the Committee on Statistics of the Republic of Kazakhstan.

Commodity production of raw cow milk in the Akmolinsky region and the Republic of Kazakhstan increased annually. The bulk of the commodity production of raw cow milk in the Akmolinsky region and the Republic of Kazakhstan for 2015-2017 was carried out by households. In 2017, the region saw a decline in the production of raw cow milk by households in the Akmolinsky region. In 2017, the region's share in the total volume of raw cow's milk production, the share of the region in the total output of agricultural enterprises, and the share of the region in the total volume of production of peasant or farmer households also decreased. Analysis of milk sales in the Akmolinsky region is presented in Table 5.

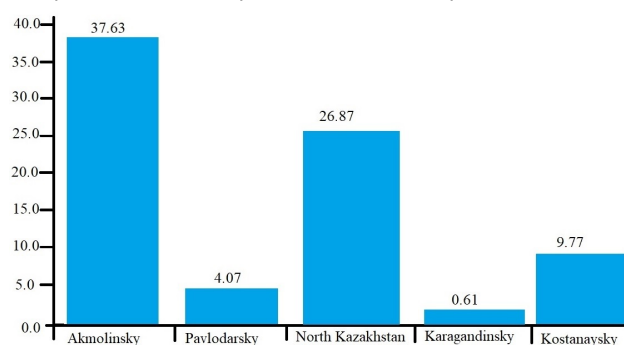
Table 5. Dynamics of milk sales in Akmolinsky region in 2015-2017, tons

Period	Sold			Production consumption	Processed for food purposes
	sold to procurement organizations	sold to processing enterprises	sold through a trading and a public catering network		
2015	110.1	14,384.9	14,003.6	12,324.5	255.8
2016	244.3	17,182.3	16,637.6	32,137.4	642.9
2017	598.0	17,179.9	19,064.7	33,812.6	636.8
Abs.chan. 2017-2015	487.9	2,795.0	5,061.1	21,488.1	381.0

Source: compiled by the author on the basis of the materials of the Committee on Statistics of the Republic of Kazakhstan

The volume of milk sold in 2015-2017 in the Akmolinsky region for 3 years increased. Production consumption recorded annual growth, in terms of processed milk for food purposes in 2016, there has been an increase, and in 2017 a decline in the indicator. Commodity of milk is low. Let us compare the production consumption of milk in the Akmolinsky region and other nearby regions of Kazakhstan in Figure 3.

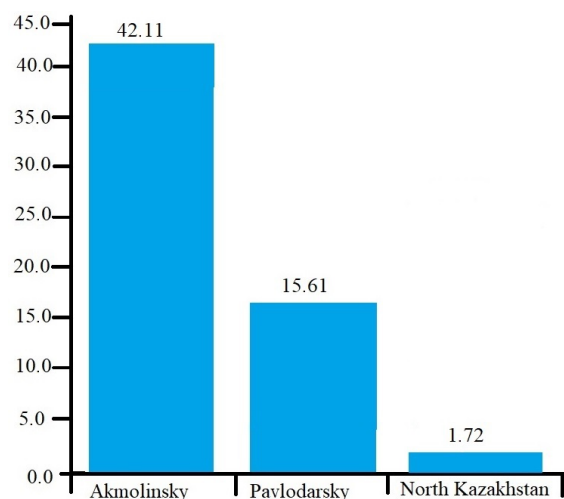
Figure 3. Structure of production consumption of milk in the Republic of Kazakhstan in 2015-2017, %



Source: compiled by the authors on the basis of the materials of the Committee on Statistics of the Republic of Kazakhstan

The production consumption of milk in Kazakhstan in 2017 was 89 864.8 tons. Almost 40% of milk consumption belongs to the Akmolinsky region. The region is ahead of the nearby areas on milk consumption. This is explained by the proximity to Astana. The structure of the mass of milk processed for food purposes in Kazakhstan is presented in Figure 4.

Figure 4. The structure of the mass of milk processed for food purposes in Kazakhstan in 2015-2017, %



Source: compiled by the authors on the basis of the materials of the Committee on Statistics of the Republic of Kazakhstan

The productivity of the dairy industry depends on various factors. The most obvious of them is the number of milk cows and the level of milk yield from each of them. Statistics of livestock of cows are presented in Table 6.

Table 6. Statistics of livestock of cows in the Akmolinsky region in 2015-2017

Indicator	2015, unit	2016, unit	2017, unit	Abs.chan. 2017 to 2015, unit	Growth rate 2017 to 2015, %
The total number of cows in the region	192,683	204,475	205,053	12,370	6.4
in agricultural enterprises	48,928	62,970	53,860	4,932	10.1
in peasant or private farms	30,241	35,645	37,010	6,769	22.4
in households	113,514	105,860	114,183	669	0.6

Source: compiled by the authors on the basis of the materials of the Committee on Statistics of the Republic of Kazakhstan

The number of cows in all categories of farms in the Akmolinsky region in 2015-2017 has been increasing annually. Most of the livestock belongs to the households. In 2017, was recorded the decline in the number of cows in agricultural enterprises and households. The level of milk yield depends on the natural productivity of cows, their health and age. Adequate conditions for the maintenance of proper and sufficient animals feeding with the content of all the necessary nutrient components is an indispensable condition in increasing the milk yield. The climatic conditions in which animals are kept also play a role. In countries with a milder climate, the yield of cows increases with other similar conditions.

Dynamics of the average milk yield per one milch cow in the Akmolinsky region is presented in Table 7.

Table 7. Average milk yield per one milch cow in the Akmolinsky region, kg

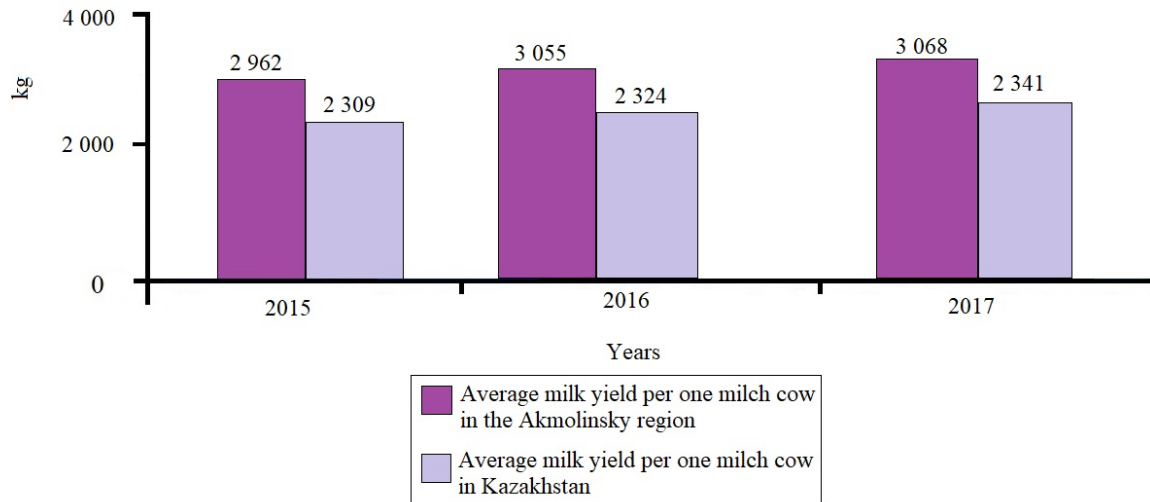
Indicators	All categories of farms	Agricultural enterprises	Peasant or private farms	Population's households
2015	2 962	4 453	2 708	2 846
2016	3 055	4 264	2 892	2 901
2017	3 068	4 033	3 028	2 906
Abs.chan.2017-2015	106	-420	320	60

Source: compiled by the author on the basis of the materials of the Committee on Statistics of the Republic of Kazakhstan.

Over the past year, the average milk yield of the cow in the Akmolinsky region amounted to 3.068 kilograms of milk in all categories of farms. But this level differs considerably depending on the form of farms that contain cows. In large agricultural enterprises, milk yields reach 4.033 kilograms, in peasant and farm economies – 3.028 kilograms, and in households – 2.906 kilograms. In agricultural enterprises, the average milk yield per dairy cow

decreased by 420 kg in three years. Let us compare the average milk yield per one milch cow in the Akmolinsky region and in Kazakhstan as a whole in Figure 5.

Figure 5. Average milk yield per one milch cow in the Akmolinsky region and in Kazakhstan in 2015-2017, kg



Source: compiled by the author on the basis of the materials of the Committee on Statistics of the Republic of Kazakhstan

The average milk yield per milch cow in the Akmolinsky region is higher than the average for Kazakhstan in 2015-2017. However, when compared with indicators in developed countries, it is much lower. In order to develop the dairy industry in the region, the "Yrys" program is being implemented in the region. The "Sybaga" program is aimed at the development of commodity cattle breeding by means of expanded reproduction of livestock in organized farms of the region. There are 14 enterprises for the production of dairy products in the region. Loading of milk processing enterprises for the processed milk production in 2015-2017 amounted to 50-62%, butter – 43-62%, cheese and cottage cheese – 64-70% (Silva *et al.* 2017).

The main share in processing milk belongs to Kokshetau (LLP Gormolzavod, LLP Moloko Sinegoriye) – 44.5%, Zerendinskiy district (LLP Milk Project) – 26.1%, Tselinogradsky district (LLP AF Rodina, LLP Maximovsky Dairy Plant, JSC Astana Onim) – 17.0%; for the production of butter Shortandinsky district (IP Kharsiyev) – 36.1%, Tselinogradskiy district (LLP Rodina, LLP Maksimovsky dairy plant) – 33.7%, Kokshetau (LLP Gormolzavod) 22.0%; for the production of cheese and cottage cheese in Kokshetau (LLP Gormolzavod, LLP Moloko Sinegoriye) – 40.9%, Tselinogradsky district (Rodina LLP, Maksimovsky Dairy Plant LLP, Astana Onim) – 21.7%, Shortandinsky district (IP Kharsiyev) – 13.3%.

#### 4. Discussion

Based on the analysis of the development of the dairy market and its economic efficiency in North Kazakhstan (on the example of the Akmolinsky region), the following trends were identified:

1. Both in the Akmolinsky region and in Kazakhstan there is a problem of low milk marketability. Under Soviet rule, it reached 70%. However, it reaches 90% today in European countries. In the Akmolinsky region it is 17% at present, in Kazakhstan it is 22%. Processors only accept a quarter of the milk produced.

2. The workload of milk processing enterprises in the Akmolinsky region is low. This problem is also considered by Nakipova (2013). She points out that currently about 25% of production capacity is used in Kazakhstan due to high competition from imports (Russia, Belarus) (Nakipova *et al.* 2013).

3. Low milk yield. The average milk yield per milch cow in the Akmolinsky region is higher than the average for Kazakhstan in 2015-2017. However, when compared with indicators in developed countries, it is much lower. This is also written in his article by Bukatov (2018). Kazakhstan is far from being in the forefront among countries in terms of milk yield for a number of different objective and subjective reasons, but also not in the last ranks. According to various sources, the republic is included in this index among the 50 first countries of the world. The first five positions on milk yields belong to Israel – more than 10.000 kilograms, then, decreasing: the USA, Greece, Japan and Sweden.

4. 77-85% of milk, milked in the Akmolinsky region – production of personal farm households, which is a negative fact, because this is an unstable source of raw materials for Kazakhstan dairies and enterprises, which requires, in addition, regular checks when used for milk production.

5. Analysis of production of dairy products in the Akmolinsky region revealed that the production of dairy products in other areas of the republic is growing at a higher rate and other types of production are also developing better within the region. In general, dairy cattle breeding in the Akmolinsky region shows an inadequate profitability of the industry, because of inflated prices for energy resources, mixed fodder, agricultural machinery, because of the increased cost of silage and haylage needed in dairy cattle breeding. This leads to low investment attractiveness of dairy cattle. A similar problem is relevant for the whole of Kazakhstan. This is noted by K.K. Nurmaganbetov. In his opinion, the development of the dairy industry is hindered due to weak raw materials base; underdeveloped infrastructure; increase in prices for material and technical resources, electricity, water, *etc.*; moral and physical deterioration of technological equipment of the dairy industry enterprises; lack of finance for the acquisition of fixed assets. All this leads to an increase in imports and a decline in exports of dairy products (Nurmaganbetov 2012).

Ways to solve the problems of the dairy market development by different authors are seen in different ways. So, Stolyarova and Stolyarova (2016) recognize the decision to improve the quality of milk, in a properly organized marketing network with the available specialized transport, refrigerating plants and other conditions, which also affects the milk quality. From the point of view of Turabayev (2014), commodity producers in Kazakhstan are uncompetitive, therefore, to improve productivity, a clear development of subsidizing the costs of commodity producers is necessary. Nurpeisova (2016) believes that one of the ways to reduce the shortage of raw materials is the creation of own farms, or the development of holding structures.

According to Smertina (2014), the following factors are important for the development of the market for milk and dairy products: the formation of organized channels for the sale of milk and dairy products, aimed at attracting third-party investors to the dairy product sub-complex and replenishment of the regional budget; an increase of competitiveness of the made production, allowing to expand commodity markets; an increase in the production of milk and dairy products.

Fliginskikh and Andreyeva (2015) believe that it is necessary to improve the process of cost management. They suggest using the achievements in the field of mathematics and information technologies, applying mathematical models and methods of optimization and multivariate analysis of development scenarios, as well as theoretical scientifically based methods of managing costs and results at both the micro- and meso levels in comparison with macroeconomic indicators.

Poleshkina and Skorobogataya (2015) believe that it is necessary to create and develop a network of processing cooperatives that produce dairy products with a low degree of processing in regions that are far from the raw material zone of milk processing enterprises with a high degree of milk processing.

Aleksandrova (2014) believes that in order to solve the problem of quality growth and competitiveness of dairy raw materials in the country, it is necessary to pay attention to the following areas: improving the selection of dairy cattle and increasing its productivity and biological value; use of progressive methods of obtaining and processing dairy raw materials; efficiency of control over the quality of raw materials in obtaining and processing on dairy farms.

Thus, the population and demand for dairy products have been growing in recent years, therefore, in order to develop the dairy market and its economic efficiency in Akmolinsky region, it is necessary to solve the problems associated with the shortage of raw materials base, the complex and difficult financial and technical situation of enterprises that cannot quite carry out complex processing of milk, to produce a wide range of high-quality and competitive products. The author's position is that the transition to new technologies, foreign experience of development, state support of the domestic producer can radically change and improve the dairy industry. In the midterm, marketable milk should mainly be produced in high-tech medium and large dairy farms.

## **Conclusions**

Summarizing the results, we can draw the following conclusions. The market of milk and dairy products is a system of economic relations between sellers and consumers, which has certain territorial, temporal boundaries, infrastructure and the price range that they determine. Now the production of milk and dairy products in Kazakhstan is one of the most promising areas of development in the agricultural sector. The main tasks of the industry in the short term are to ensure the needs of the domestic market with high-quality products available to a wide range of consumers, import substitution, as well as an increase in the export potential of milk and dairy products. The analysis of the dairy market development in the Akmolinsky region has revealed such problems as: low milk marketability, low workload of milk processing enterprises, low milk yields compared to developed countries, predominance of personal part-time farms in the structure of milk producers (affecting quality), low development of dairy production products.

Given the identified problems in the development of the dairy market in the Akmolinsky region, recommendations were made on its development. The author's position on the development of the dairy market in the Akmolinsky region is as follows: the intensive development of the livestock sector, the procurement of quality feed, the increase in the number of livestock, as well as the increase in their productivity, and a significant improvement in the milk quality. In addition, the government needs to develop subsidies for the costs of commodity producers of dairy products. All this will allow increasing the production volumes of high-quality dairy raw materials and dairy products, to load the capacities of the dairy processing enterprises and to increase the competitiveness of domestic products in the domestic and foreign markets.

At the same time, there is a need to further study the features and trends in the development of the milk market in conditions of deepening globalization processes, identifying opportunities to strengthen Kazakhstan's position in the global milk market. The most promising areas of further research in the development of the milk market is the study of the experience of the leading countries of milk exporters, which will provide an opportunity to find out which tools are the key to the dairy market development.

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## The Management of Human Resources in Health Industries: A Multicriteria Approach

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### Abstract:

In this paper we consider the problem of optimal management of human resources in a very peculiar framework that is Health Industry. Starting from a case study we consider a general problem of optimal mobility between employees that offer their services in a multidimensional Health Industry in a wide regional area. The case we have in mind is the possibility for a number of employees in the same Health Industry to move in different locations according to both personal and strategic reasons. The firm management must consider a number of variables and criteria in order to define a final ranking between the employees in the same category; consequently, a typical multicriteria decision problem arises. In this paper we propose a possible solution that takes into account quantitative criteria and optimal business strategies in order to define the optimal allocation of resources.

**Keywords:** health industry; multicriteria analysis; human resources; mobility

**JEL Classification:** O15; P36; D81; C44

### Introduction

The problem of optimal allocation of human resources is a very important issue above all in the case of Health Industries where a public or a controlled company manages the health services of a geographical region with many locations (Chen *et al.* 2004, Dowling, Schuler and Welch 1991, Grilli and Russo 2017, Hendry 2012, Leonard, Graham and Bonacum 2004). The health service is a 24 hours - 365 days service and must always guarantee a very high level of performance. In this study we consider, for sake of simplicity, three kinds of employees that are: nurses; rescuers and drivers. In general, a typical working day consists of three shifts (8-14; 14-20 and 20-8) with a fixed minimum number of nurses, rescuers and drivers in order to provide an appropriate health service.

Let us suppose that the region consists of  $k$  (integer) hospitals with a minimum number of employees sufficient in order to provide the health service also in the case of absences or leaves.

The health firm management must allocate or re-allocate periodically and optimally, all the employees in all the hospitals in the region (Grilli and Russo 2017).

The allocation of human resources takes into account different specific criteria that go from personal, familiar to working-economical issues. The management must re-allocate the employees in the area considering a number of criteria approved by all involved parts. In order to obtain this goal it is necessary a bargaining process that should involve workers, unions and firm management in order to find a number of criteria, related to residence, seniority, family status and also meritocratic aspects.

We consider a specific case-study proposed by a controlled Health Firm in the southern Italy, as shown in the section 3. The model has been successfully adopted by the health firm and can be considered in a most general framework.

### 1. The Methodology

We consider a general case of a firm with a fixed number of employees indicated by:  $L_i$  with  $i = 1, \dots, n$ . The employees can be also of different types and categories. As stated before the health company must guarantee a 24 h – 365 days service provided in three working shifts of 8 hours each. The workers can be allocated in a geographical area with a fixed number of towns:  $T_i$  with  $i = 1, \dots, m$ .

The Health Firm has to find an optimal allocation for all the  $n$  employees taking into account a number of criteria that are fixed and shared in advance. Let denote by  $C_i$  with  $i = 1, \dots, k$  each criterion. In our case, the bargaining process with unions, workers and management has produced and selected the following criteria:

- Work Experience (in other health-companies):
  - less than 2 years = no points;
  - between 2 and 5 years = three points;
  - more than 5 years = six points.
- Work Experience in the firm: 6 points for each year (365 days);
- Children: eight points for each under-age child and four points for every adult-child in the family nucleus;
- Certified disability: 12 points;
- Work experience in the specific location in which the employee should be moved: 2 points for every year of service, up to a maximum of 10 points.

In order to compute the ranking in each town, all the employee of the company is invited to complete a survey that includes the following information: personal data, position, hire date in the company, city of residence, previous positions (with hire date and date of contract end), family status, under-age children and adult children, disability conditions, favourite work towns (up to four), work experience in each favourite work town.

Once the survey has been completed, the data undergo a review process in order to avoid errors and inconsistencies. The validated date is computed according to the selected criteria and a final ranking is obtained for each town and for each position involved in the analysis. The final rankings in each town and for each position allow the human resource manager to select and move employees among the different work locations by means of quantitative criteria. In the following section we present a case study in which this procedure has been applied.

## 2. Case Study

In this section we present a case study in which the previous methodology has been applied. We consider the case of a controlled health company in a region in Southern Italy which manage the emergency ambulance service in a wide area consisting of 34 towns.

The company counts about 275 employees divided into three main categories: nurses; rescuers and drivers. The problem is to manage optimally the mobility of employees in each town. It is a typical problem of ordering procedure in a multivariate context (Grilli, Russo and Sfrecola 2011, Grilli and Russo 2008).

Following the methodology illustrated in the previous section, the employees have completed a survey containing the following information: personal data; position; hire date in the company; city of residence; previous positions (with hire date and date of contract end); family status; under-age children and adult children; disability conditions; favourite work towns (up to four); work experience in each favourite work town.

We have collected 275 survey that are: 87 rescuers; 86 nurses and 102 drivers. Data have been validated in order to apply the selected criteria that are: Work Experience (in other health-companies); Work Experience in the firm; Family Status; Disability conditions; Work experience in the selected location.

In Table 1 we present an example (simplified) of data obtained (personal details have been erased) in the case of one workers' category:

Table 1. Town X. Selected data from the survey. In this table we have erased all the personal data and other information that are not relevant in the example.

Worker	Work Experience in this firm (days)	Previous Work Experience	Number of sons (TOTAL)	Under-Age Children	Work Experience in the selected town	Disability Condition
A	3163	3614	2	1	9	Y
B	3346	3942	4	3	6	N
C	3407	1976	0	0	6	N
D	2615	1644	1	1	4	Y
E	3103	1005	1	1	2	N
F	3042	0	1	1	2	N
...	...	...	...	...	...	...

In the following Table 2 we present an example of the results of computations for one worker category.

Table 2. Town X. Criteria: C1 Work Experience; C2 Seniority in the present firm; C3 under-age children; C4 adult-children; C5 Certified Disability; C6 Work experience in the selected town.

Town X		Date: 31/12/2017						
Ranking	Worker	C1	C2	C3	C4	C5	C6	Score
2	A	6	52	8	4	12	10	92
1	B	6	55	24	4	0	10	99
4	C	6	56	0	0	0	10	72
3	D	3	43	8	0	12	8	74
5	E	3	51	8	0	0	4	66
6	F	0	50	8	0	0	4	62
...	...	...	...	...	...	...	...	...

The health firm management, provided with rankings for all workers' category, can decide optimally how to re-allocate the human resource according to the firm and service needs.

The present method has been usefully tested and the firm currently applies this method for the management of the human resource in term of spatial allocation.

### Conclusions

We have presented a method to solve the problem of optimal allocation of human resource in the health industry in the case of a big number of employees and different working locations (in different towns). The problem has been addressed by a big health public company with about 300 employees in 34 towns. The human resource manager has the problem of optimal reallocate the employees according to specific needs that are often service related. The health service has peculiar characteristics since it must be ensured 365 days per year, 24 hours per day. The company was not able to apply quantitative methods in order to decide how to distribute the workers among the different towns. The decision process started with a consultation with the stakeholder including workers' unions in order to define the criteria to be adopted in order to create the final rankings.

Once obtained the list of criteria and weights for each criterion, a method of ordering data by means of a multicriteria method has been proposed and the firm has successfully applied it. We think that similar methods can be adopted in other similar contexts in which there are a big number of employees to be re-allocated in different locations.

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## Marketing Management of the Competitive Advantages of Pharmaceutical Companies

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### Abstract:

This article presents an analysis of the functioning of the pharmaceutical industry in the Republic of Kazakhstan, including the marketing management of the competitive advantages of pharmaceutical enterprises in Kazakhstan. Analyzing the pharmaceutical industry of Kazakhstan, emphasis was placed on the marketing activities and competitive advantages of such pharmaceutical enterprises in Kazakhstan as JSC Khimpharm and Nobel based on a SWOT analysis and regression analysis.

**Keywords:** pharmaceutical market; competitive advantage; marketing management; strategy

**JEL Classification:** M31; M38

### Introduction

Modern pharmaceutical business has characterized by a significant increase in the role of marketing activities in the formation of sustainable competitive advantages based on generic (copying original drugs) and innovative product strategies. However, in the development of the domestic pharmaceutical industry there are a number of negative trends:

- decline in sales and the level of competitiveness of goods produced due to the stagnation of their production;
- low quality and further progression of the stage of decline in the life cycle of products, caused by their inconsistency with modern methods of drug therapy and the requirements of national therapeutic standards.

In this regard, in the Kazakhstan market of pharmaceutical products there is a significant competitive pressure of imported drugs (they account for over 80%) and a further decline in the share of companies in our country.

The entry of Kazakhstan into the WTO, providing for the fulfilment of its internal requirements, the liberalization of customs policy, the introduction of the rules of Data exclusivity, led to an increase in the competitive pressure on imports of pharmaceutical products. At the same time, for domestic producers, the possibility of using the traditional approach to the release of goods based on the generalization of products that have lost patent protection is reduced. Therefore, there is a need to search for and implement the internal reserves of the pharmaceutical companies themselves in order to create the prerequisites for the growth of their competitiveness, competent marketing management of the competitive advantages of pharmaceutical enterprises in Kazakhstan.

### 1. Research Background

Currently, the domestic economic literature presents a number of provisions on ensuring the competitiveness of pharmaceutical manufacturers; however, with the further integration of the Republic of Kazakhstan into the world economy, there is a change in the processes that require new research.

The theoretical and methodological basis of the research was the scientific works of domestic and foreign scientists, publications on the studied problem in periodicals, materials of international, domestic scientific and practical conferences and seminars devoted to theoretical and practical issues of development of the marketing system of pharmaceutical enterprises.

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The research was based on statistical materials of the Pharmacy Committee of the Ministry of Health of the Republic of Kazakhstan, data from the Ministry of National Economy of the Republic of Kazakhstan.

Analytical studies are based on secondary information sources that have been widely developed in the pharmaceutical market and include, in particular, the results of syndicated panel studies of end users and other target audiences of pharmaceutical companies, audits of the retail and hospital market, results of monitoring advertising in the media, etc.

In his book *Competitive Strategy: A Methodology for Analyzing Industries and Competitors*, Porter (2011) says that in the modern world, the competitive struggle in domestic and foreign markets for goods and services is becoming increasingly fierce, primarily as a result of the emergence of new methods and forms of economic rivalry. Under these conditions, Kazakhstan entrepreneurs come to realize the need to use marketing as a management concept. Modern marketing allows enterprises not only to survive in a competitive environment, but also to realize strategic, long-term goals, such as: winning market share, entering foreign markets, maximizing profits, etc.

Interest in the concept of marketing aimed at the survival and development of enterprises in an uncertain market environment through customer orientation has related to the fact that the latter is the main source of income for commodity producers in a market economy. Marketing is objectively necessary for domestic enterprises, many of which are forced to work in strategic economic zones characterized by increased risk due to insufficient knowledge of the environmental factors that are critical for the survival of the enterprise.

In today's rapidly changing situation with a high degree of uncertainty, a narrowed planning horizon, a certain focus on solving current, immediate problems and a weak connection with the company's general strategy, traditional marketing concepts in Kazakhstan are not sufficiently effective. Some authors, such as Danko and Skorobogatyh (2014) say that in these conditions, priority in planning marketing activities should be given to a strategic approach, when focus on global goals, prospective potential demand, strategic opportunities and long-term competitive advantages come to the fore.

In the conditions of tough competition that has developed in most product markets in Russia, enterprises are making serious efforts to influence consumers and encourage them to buy. Since the majority of consumers do not belong to the category of buyers - innovators, they choose only a limited number of the variety of existing goods and services. Under these conditions, the main task of manufacturers is to ensure that their product falls into this field of choice, which will increase the likelihood of buying it. This is possible only when the product, according to the buyer, is significantly different from similar products and is of significant value to it. In marketing, a similar opinion has formed in the minds of consumers for positioning (Zhadko 2017).

Golubkov (2016) adds to this that the position "this is the opinion of a certain group of consumers, target market segments, regarding the most important characteristics of the product". Serious attention has paid to the concept of the strategic position of David Aaker. Calling her "the face of business strategy", he emphasizes that it is the strategic position that reflects how, in the company's opinion, consumers should perceive it (Aaker 2016). This indicates the company's ability to shape in the minds of consumers the perception it needs, *i.e.* on her full control over the position.

Thus, the position of the goods (services, enterprises) has formed in the minds of consumers. However, it should differ significantly from the position of competitors; only in this case, consumers will distinguish the company and its products in the market among a large number of similar ones. The search for an unoccupied position, its development, retention and formation in the minds of target consumers - this is, in fact, the process of positioning.

Very precisely, in our opinion, Kovalev and Isaeva (2016): "The basic principle of positioning is not to create something new and different from others, but to manipulate what already lives in the minds of consumers, to use already existing connections and perceptions".

Aaker (2016) offers 15 directions for an enterprise to build its position, with serious attention paid to positioning based on emotional benefits. Peter Doyle argues that an enterprise can develop a positioning strategy based on a combination of a differentiation, focusing and cost leadership strategy (Doyle and Stern 2017).

Summing up, it can be noted that among the authors there is no consensus on the main issues of positioning. Therefore, the development of the theoretical foundations of positioning will undoubtedly continue. And the further aggravation of competition in commodity markets and the growth of consumer culture will push enterprises to find new unexpected solutions in the positioning process

## 2. Methodology

The development of the pharmaceutical industry in Kazakhstan provides for a set of organizational, economic, technological, management activities aimed at designing, building and putting into operation of pharmaceutical production, introducing production technologies, research and development and development work on developing

and mastering the production of new competitive drugs, the creation of raw materials in the regions of the domestic medicinal plant of raw materials, training for pharmaceutical production in accordance with GMP, which ultimately should help increase production volumes of domestic production.

And today, the domestic pharmaceutical industry is engaged in research, development, mass production and distribution of medicines, medical devices and medical equipment. Currently, more than 200 pharmaceutical enterprises are operating in the Kazakhstan market. Of these, about 11 production sites of 7 domestic enterprises comply with international standards for compliance with GMP quality (Good Manufacturing Practice).

With state support for local pharmaceutical production, steady growth in the pharmaceutical market in recent years, and a generally positive macroeconomic climate, Kazakhstan is becoming an attractive destination for pharmaceutical companies as a target market and a regional center.

According to the Ministry of National Economy of the Republic of Kazakhstan, the pharmaceutical industry is represented in Kazakhstan by more than 80 enterprises - foreign and local manufacturers of pharmaceutical products, including small manufacturers of medical products. Domestic enterprises: JSC Khimpharm, JV Global Farm, JSC Nobel AFF, Romat pharmaceutical companies and Dospharm are full-cycle enterprises, including the development and implementation of technological processes, the production of finished dosage forms, the implementation of medical institutions and consumers through the distribution and pharmacy networks.

In the first half of this year, the number of enterprises in the pharmaceutical industry also increased from 10 to 11 enterprises. Among the largest ones, it is possible to single out JSC Khimpharm, JSC Nobel AFF, LLP Abdi Ibrahim Global Farm, LLP Dosfarm, LLP Karaganda Pharmaceutical Plant. These and other domestic pharmaceutical companies produce more than 800 kinds of medicines.

Production growth is taking place against the background of a fairly significant reduction in investment in the industry. During the period under review, their volume decreased by 45% compared with the same period of 2016, reaching 3.2 billion tenge (US \$ 9.9 million), see Table 1.

The pharmaceutical market of Kazakhstan among the countries of Central Asia for foreign manufacturers still remains the most accessible and transparent from the point of view of the legislative environment. In the short term, the main factors determining the development of the pharmaceutical market in Kazakhstan will be a balanced import substitution policy and integration into the regional (Eurasian Economic Union) and global (World Trade Organization) systems. In the longer term, a country can use its favorable business environment and regional connections in terms of exporting pharmaceutical products to neighboring countries characterized by a growing population and the lack of domestic productive capacity - Uzbekistan, Kyrgyzstan, Turkmenistan, Tajikistan.

Table 1. The main indicators of the pharmaceutical industry for 2016-2017

Indicator	2016	2017
Production volume, in mln. Tenge	18,693,0	37,842
Investments in the industry, in mln. Tenge	5,753,0	3,165
Production, tons	8,164,0	11,336
IFO, in %	101,7	134,600
Import of drugs, thousand tons	14,7	26,100

Source: compiled by authors to data of Ministry of National Economy of the Republic of Kazakhstan

In the first half of 2018, in the rating of countries of producers by share in the volume of pharmacy sales, in physical terms, Kazakhstan ranked second, in value terms - only fourth. But at the same time, domestic companies showed the highest rates of sales growth, which significantly outpace the growth of the pharmacy segment as a whole. Thus, in tenge terms they increased by 12.7%, in packs 13.9% (Table 2).

Table 2. TOP-10 countries of producers by share in the volume of retail sales in value terms in the 1st half of 2018 and 2017

№	Producer countries	1st half of 2017		1st half of 2018		Growth 2018/2017, in %
		In mln. tenge	Share, in %	In mln. tenge	Share, in %	
1	Germany	18.461,2	13,2	20.517	14,4	11,14
2	Russia	17.457,5	12,5	17.258	12,1	-1,14
3	USA	14.744,1	10,6	15.020	10,5	1,87
4	Kazakhstan	11.580,6	8,3	13.051	9,2	12,70
5	India	8.479,2	6,1	8.344	5,9	-1,60
6	France	7.661,4	5,5	7.829	5,5	2,18
7	Great Britain	6.864,2	4,9	6.713	4,7	-2,20
8	Slovenia	5.817,1	4,2	6.025	4,2	3,58
9	Hungary	6.124,1	4,4	5.738	4,0	-6,31



№	Producer countries	1st half of 2017		1st half of 2018		Growth 2018/2017, in %
		In mln. tenge	Share, in %	In mln. tenge	Share, in %	
10	Austria	5.673,6	4,1	5.399,0	3,8	-4,84
TOTAL		139.587,7		142.594,6		2,15

Source: compiled by authors according [www.pharm.reviews](http://www.pharm.reviews)

According to JSC Kazakhstan Institute of Development in a regional context, the leaders of domestic pharmaceutical production are:

- Shymkent (41.9%),
- Almaty region (31.4%),
- Almaty (15.7%).

Speaking about the growth of pharmacy sales of products of domestic pharmaceutical enterprises, it should be noted that here, again, not the last role is played by long-term contracts. This effective measure allows you to attract investment in the industry, provides a steady flow of financial resources that help to systematically develop production, introduce and maintain international standards, develop new products, hire the best specialists and improve their skills.

In general, the state provides pharmaceutical manufacturers with various support tools. But, as can be seen, the most significant and effective measure is the long-term contracts for the purchase of products concluded between LLP SK-Pharmacy and manufacturers.

Analyzing the pharmaceutical industry of Kazakhstan, we focus on the marketing activities and competitive advantages of such pharmaceutical enterprises in Kazakhstan as JSC Khimpharm and Nobel.

The share of the five largest companies accounts for more than 77% of all drugs manufactured in Kazakhstan in monetary terms. JSC Khimpharm, JSC Nobel Almaty Pharmaceutical Factory, LLP Abdi Ibrahim Global Farm, LLP Kelun Kazfarm and JSC Pharmacy represent full-cycle enterprises, including the development and implementation of technological processes, the production of finished dosage forms, the implementation medical institutions and consumers through the distribution and pharmacy networks.

The data of the Pharmacy Committee of the Ministry of Health of the Republic of Kazakhstan and LLP SK-Pharmacy publish the TOP-10 manufacturers by share in the market volume headed by the Kazakh company SANTO (JSC Khimpharm). Its share in terms of value in the first half of 2018 almost reached 6%, and in real terms - 11.3% (Table 3).

Table 3. TOP-10 manufacturing companies by share in the market volume in terms of value for the 1st half of 2018

№	Company	2017		2018		Growth 2018/2017, in %	
		Market share, in %					
		tenge	packaging	tenge	packaging	tenge	packaging
1	Santo	5,51	10,8	5,99	11,32	1,46	0,30
2	Sanofi-Aventis	5,56	1,6	5,87	1,56	-1,37	-6,73
3	Nobel-Aff	3,29	1,5	3,89	1,78	10,47	15,30
4	Teva	2,84	1,5	3,43	1,71	12,45	11,78
5	Bayer Healthcare	3,44	0,7	3,22	0,76	-12,63	0,40
6	Johnson@ Johnson	2,69	0,5	2,76	0,54	-4,15	6,48
7	Pfizer	1,80	0,1	2,67	0,05	38,33	-23,67
8	Nycomed Takeda	2,39	0,9	2,43	0,88	-5,18	-10,00
9	Sandoz Group	1,88	0,8	2,30	0,81	14,18	-4,99
10	Glaxosmithkline	2,63	0,9	2,28	0,91	-19,24	-0,22
TOTAL						-6,69	-4,66

Source: compiled by authors according data of Pharmacy Committee of the Ministry of Health of the Republic of Kazakhstan.

In addition to SANTO, another domestic manufacturer has long been present in the TOP-10 companies. This is JSC Nobel AFF, which, having increased sales by 10.5% in value terms and 15.3% in physical terms, took the third position in the first half of 2018.

In many respects, today's successes of Kazakhstan producers are promoted by the support they receive in government procurement, in particular, long-term contracts. And although, in general, following the results of the first half of 2018, the volume of purchases of pharmaceutical products for the GFMP in value and physical terms decreased, the share of Kazakhstani producers increased - in real terms from 59% in the first half of 2017 to 66.3% in the first half of 2018 years, in value terms - from 19% to 23.2%, respectively.

But Kazakhstani producers are not only increasing their presence in the public procurement sector. They systematically increase sales in the retail segment, which is very important, since its volume is several times larger than the segment of purchases for the GVFM, both in value and in kind. It is clear that in this segment they have to work without any support, on a par with other market participants, in conditions of tough competition for the recognition of doctors and consumer preferences.

As already noted, long-term contracts are a significant incentive for the construction of new or modernization of existing production sites in accordance with international GMP standards. After all, this is the main condition for their conclusion. Thus, from the beginning of the application of this support measure, 24 production sites appeared in the republic, operating according to the rules of GMP.

The results of the first half of 2018 show that the Kazakhstan pharmaceutical market is going through difficult times. This is mainly due to the economic situation, the policy of the regulator, aimed at rationalizing the costs of medicines purchased for the GFMP. The high volatility of the national currency exchange rate, the decline in the purchasing power of the population and the associated change in the structure of demand in favour of cheaper preparations-synonyms contribute to this.

Only local producers are increasing their market share. Especially in the procurement segment for the GVF. According to the Pharmacy Committee of the Ministry of Health of the Republic of Kazakhstan and SK-Pharmacy LLP, for 2018, 536 names of medicines and medical products in the amount of 50.4 billion tenge have already been acquired by the Single Distributor to provide the GFMP (Table 4).

According to the results of the first half of 2018, Kazakhstan took the first position in the rating of producer countries by share in the market volume. Whether domestic producers will be able to retain the leading position, only time will tell. But there are certain prerequisites for this now.

Table 4. TOP-8 domestic manufacturers of drugs (A) and medical devices (B) in the amount of purchases for the GVFM (tender, contract, contract) for 2018

Domestic manufacturers	Medication (A)		Domestic manufacturers	Medication (B)	
	Mln. tenge	Share among OTP, in %		Mln. tenge	Share among OTP, in %
Santo JSC Khimpharm	12.664	25,1	LLP Dolce	2.652	5,3
JSC Nobel Aff	12.622	25,0	LLP Axel and A	2.122	4,2
LLP Abdi Ibrahim Global Farm	7.193	14,3	LLP Super Pharm		3
LLP Nur May Farmaciya	1.913	3,8	LLP KazMedProm	1.395	2,8
LLP EcoFarmInternational	1.895	3,8	LLP Almerik	740	1,5
LLP Viva Farm	1.483	2,9	Wellness center Massimov	680	1,3
LLP Kelun-Kazpharm	1.337	2,7	LLP Juldyz Kenan	271	0,5
Others	1.610	3,2	LLP Sultan	123	0,2
			Others	215	0,4

Source: compiled by authors according to data of Pharmacy Committee of the Ministry of Health of the Republic of Kazakhstan

### 3. Application functionality

According to the Pharmacy Ed. T.P. Danko, I.I. Skorobogatyh and LLP SK-Pharmacy, in 2019 the range of domestic pharmaceutical products purchased under long-term contracts will increase to 493 drugs and medical devices (231 drugs, 262 medical devices), and by 2021 it will be replenished with another 112 LS and 32 medical devices.

In this regard, an increase in the volume of purchases of the Single distributor of domestic pharmaceutical products in monetary terms from 30 billion tenge to 73 billion tenge in 2024 is predicted. This will help increase the share in the budget segment and, if Kazakhstan pharmaceutical manufacturers continue to develop actively in retail, they will have every chance to remain number one in the market.

Thus, on the basis of the data that were shown in Tables 3 and 4, JSC Khimpharm and JSC Nobel AFF among the domestic pharmaceutical manufacturers are the leaders. JSC Khimpharm takes 34% in value terms. The market share for the year was 4.7%, losing to a competitor Sanofi-Aventis with a market share of 6.3%. In this connection, we can talk about effective marketing management and, accordingly, having certain competitive advantages compared to other pharmaceutical companies in Kazakhstan.

Based on this, we carried out a SWOT analysis of the company Khimpharm and Nobel AFF (Table 5).

Table 5. SWOT analysis of the company Khimpharm and Nobel AFF

Strengths:	Opportunities
<ul style="list-style-type: none"> <li>▪ The leader of the domestic pharmaceutical industry - careful planning, a high level of enterprise stability and sustainable development;</li> <li>▪ the largest volume of production, sales and a wide range of products in Central Asia;</li> <li>▪ organized distribution system of goods, including export;</li> <li>▪ development of CSR;</li> <li>▪ availability of unique licenses, technological equipment of the last generation and many years of production experience;</li> <li>▪ modernization of production sites and infrastructure facilities;</li> <li>▪ warehouse automation;</li> <li>▪ compliance with the requirements and standards of the National Legislation of the Republic of Kazakhstan;</li> </ul>	<ul style="list-style-type: none"> <li>▪ growth in the field of high-quality and more expensive drugs;</li> <li>▪ growth of the pharmaceutical market in Kazakhstan;</li> <li>▪ integration of production processes;</li> <li>▪ Compliance with the world level of automation;</li> <li>▪ further modernization of production sites;</li> <li>▪ maintain the position of the largest employer in the industry;</li> <li>▪ ample opportunities in the field of distribution and marketing, a high share in the markets of Kazakhstan, CIS countries and far abroad.</li> </ul>
Weakness	Threats:
<ul style="list-style-type: none"> <li>▪ a high proportion of low-margin products in the total product portfolio;</li> <li>▪ weak domestic pharmaceutical industry;</li> <li>▪ relatively low management efficiency of the supply chain;</li> <li>▪ change of monetary policy in the country</li> </ul>	<ul style="list-style-type: none"> <li>▪ limited budget for public health due to the deteriorating economic situation;</li> <li>▪ increased competition</li> <li>▪ a large amount of registration documents;</li> <li>▪ problems in operation (energy, transport infrastructure);</li> <li>▪ inefficiency of the quality control system for raw materials, processes and finished products;</li> <li>▪ inconsistency of the process with safety requirements;</li> <li>▪ inflation rates;</li> <li>▪ - exchange rate fluctuations.</li> </ul>

Source: compiled by authors

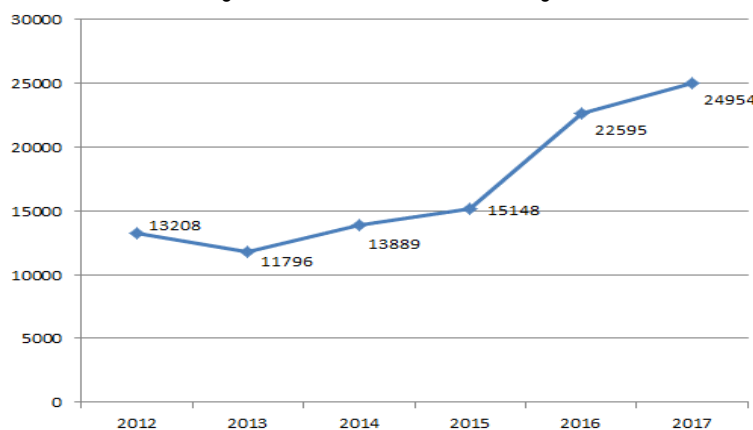
Understanding the strengths contributes to the effective use of market opportunities and the avoidance of its threats, identifying weaknesses that will allow developing protection, as well as planning to minimize losses.

Since the company JSC Khimpharm occupies a slightly larger share in the drug sales market, let us consider, based on the available data on the sales volume of the Khimpharm firm, we will build a trend model with the help of which we will calculate the predicted value of the considered indicator for 2018 and 2019.

Analytical methods for identifying trends in the time series are implemented in the framework of regression models, in which the variable is a dependent variable  $y_t$ , in our case, the sales volume, and as the only explanatory variable time  $t$ .

Trend parameters are estimated using the least squares method, *i.e.* are selected in such a way that the graph of the function is located at the minimum distance from the source data points. According to the OLS, when estimating the parameters of the model, equal weights are assigned to all observations, *i.e.* their information value is considered equal, and the development trend throughout the observation area is unchanged. Build a graph of the dynamics of sales for 2012-2017.

Figure 1. Sales volume, in mln. tenge



Graphical analysis indicates the proximity of the development of the indicator in question to the parabolic form. Using the Excel setting "Data Analysis" we will build a parabolic trend. The protocol for performing regression analysis is presented below in Table 6.

Table 6. The protocol for performing regression analysis of sales for 2012-2017

CONCLUSION OF THE RESULTS		
<i>Regression Statistics</i>		
Multiple R	0,973240196	
R- square	0,947196479	
Normalized R- square	0,911994131	
Standard Error	1.620,040941000	
Observations	6	
<i>Analysis of variance</i>		
	<i>df</i>	<i>SS</i>
Regression	2	141.237.631,40
Balance	3	7.873.597,95
Total	5	149.111.229,30
	<i>Coefficients</i>	<i>Standard Error</i>
Y- intersection	14404,9	2.898,0173360
T	-2394,275	1.895,9621300
t <sup>2</sup>	719,125	265,1414372

Source: compiled and calculated by authors

Thus, the equation of a parabolic trend will take the form:

$$y_t = 14404,9 - 2394,275t + 719,125t^2.$$

To determine the forecast values of the sales volume, it is necessary to substitute the corresponding value of the time parameter into the resulting model ( $t = 7$  и  $t = 8$ ):

$$y_7 = 14404,9 - 2394,275 \cdot 7 + 719,125 \cdot 7^2 = 32882,1 \text{ mln. tenge};$$

$$y_8 = 14404,9 - 2394,275 \cdot 8 + 719,125 \cdot 8^2 = 41274,7 \text{ mln. tenge}.$$

Thus, the predicted values of sales for 2018 and 2019 will be, respectively, 32,882.1 and 41,274.7 million tenge. Taking into account the fact that the adoption of production, financial, administrative, and other decisions will be based on information coming from the market, with the development of market relations, marketing will increasingly integrate into the overall management system" market: business fundamentals" describes Shlyk (2014).

Analysis of marketing management in the activities of the company Khimpharm and Nobel AFF give us an idea that these companies have modernized and automated the company's warehouses, implemented a management system. All modern production lines comply with the requirements and standards of the National Legislation of Kazakhstan. Products that are manufactured in these companies have the availability and quality of medicines required to provide modern drug therapy in accordance with the needs of the modern health care system. The range of these companies is aimed primarily at the supply of essential medicines in the framework of the state provision of free medical care. But there is a product portfolio designed for the development of retail potential.

The production strategy is global governance and local implementation that helps ensure the uninterrupted satisfaction of the needs of public health systems. To meet customer demand and maintain compliance with regulatory requirements, while maintaining competitiveness, a quality assurance department has been created, which works in close cooperation with the heads of industrial departments, where strategies and standards are defined, in accordance with which production processes are carried out at an appropriate level of quality.

Active activities in the field of marketing management of companies allow to successfully developing a new range of modern products with high profitability under their own brands and modern generic products. Focusing on modern brands allows for an annual increase in sales and profitability of the company, and also creates the foundation for successful development of the company in the market in the long term.

Developed and implemented marketing PR-companies associated with the strengthening of the positive image of companies, the promotion of the product portfolio. The main objectives of a PR company are to inform all target audiences about new benefits, a new quality level of products meeting the international standards of the pharmaceutical industry, as well as creating a favorable information environment for building and increasing customer loyalty to products of new projects.

Thus, the main thing in pharmaceutical marketing is a dual and complementary approach:

- on the one hand, a thorough and comprehensive study of the pharmaceutical market, demand, tastes and needs;
- on the other hand, an active impact on the pharmaceutical market, on existing demand, on the formation of needs and consumer preferences.

Focusing on the consumer, on his needs and requirements determines the marketing concept, since the more satisfied consumers are, the better will be the indicators of its income, the more competitive it will be in the minds of consumers as compared to others.

Analyzing the international experience of the pharmaceutical industry, the best-selling drugs on a global scale and having considered the new products of 2017, and the main trend of the development of the global pharmaceutical industry emerges.

Most likely, we will witness the main radical change in the technology of pharmaceutical production, as there is a transition from mass chemical synthesis to methods of biotechnological production. Therefore, the future in the pharmaceutical industry is behind biotech drugs. According to estimates by Evaluate Pharma, the volume of the anticancer drugs segment due to the introduction of completely new drugs and new treatment regimens may exceed \$ 50 billion by 2022. Drugs that have the potential to fundamentally change the known methods of treatment, significantly reduce the side effects of drug therapy, or cure illnesses that cannot be cured for the first time in the history of medical science are expected to enter the market.

All leading companies have embarked on the development and sale of promising medical and most of their biotech drugs. At the same time, some of the market leaders resolutely put these directions into the focus of their economic activity and abandoned unnecessary or insufficiently unprofitable assets. Along with the intensification of their internal work on the development of new molecules, they in their acquisition policies show a very selective approach and focus on such promising areas as oncology, infections, cardiovascular diseases, diabetes, dermatology, vaccines, diagnostic tools and orphan drugs. It is in these segments that decisive shifts in the development of medical science are expected in the future.

Since the development of a modern medicinal product is a very capital-intensive and time-consuming process that contains many entrepreneurial risks, pharmaceutical companies focus on strictly selected projects and carry out large-scale activities aimed at reducing the costs of economic activity.

In today's environment, only pharmaceutical companies that have a sufficient sales volume, have an optimized structure for working with clients and possess the necessary new concepts for successful work, may be able to conduct profitable business in this particular area. For this reason, leading pharmaceutical companies are consolidating, consolidating, or even selling their over-the-counter business.

It is to be expected that it is in this area that projects between large companies in the form of joint ventures for promotion may turn out to be unsuccessful. Surviving in this area for small and medium-sized pharmaceutical companies will also be extremely problematic.

Analyzing the process of consolidation in the industry in 2017, we can distinguish the following main features:

- purchase by large pharmaceutical companies of any company that has promising projects in a promising area at almost any price;
- territorial expansion or strengthening of the market position in certain regions with growth prospects, for example, "Pharmerging" markets";
- the process of cleaning assets and selling "non-profit units";
- the rapid process of consolidation in the field of OTC drugs at all levels of the pharmaceutical industry;
- the emergence of new counterparties in the market for non-prescription drugs in the face of Internet commerce and large food companies.

## **Conclusion**

Currently, the pharmaceutical market in Kazakhstan is developing in accordance with the main global trends:

- provided a variety of pharmaceutical products and medical products presented in the pharmacy network
- modern trade formats are being developed - pharmacy chains, sales via the Internet;

- there is a consolidation of market players, the development of vertically integrated holdings;
- local production of pharmaceutical products is increasing, including as part of the import substitution policy;
- the share of manufacturers from developed countries is gradually decreasing due to the growth of manufacturers of generic drugs (mainly India).

But despite the dynamic growth of domestic pharmaceutical production, which is taking place not without the help of public investment, there is still a significant dependence on the import of medicines on the pharmaceutical market in Kazakhstan. There are several reasons for the existence of such a relationship:

▪ *first*, it is an insufficient level of "high-technology" of domestic factories and plants for the production of a number of drugs that can compete with imported ones. Modernization of production capacity requires a large amount of investment. Most domestic manufacturers do not have such an opportunity; therefore, only some enterprises in this industry produce less competitive pharmaceutical products;

▪ *secondly*, in Kazakhstan there is a low average income level of the population in comparison with neighboring countries, such as Russia and Ukraine, therefore generic drugs dominate the market in the line of OTC drugs, which are much cheaper than the original drugs. In addition, the growth of domestic consumption of pharmaceutical products is constrained by a relatively small population and complex infrastructure. All this reduces the potentially high profitability of the pharmaceutical industry, and therefore "undermines" the prospect of dynamic growth, causing the domestic market, for lack of choice, has to "absorb" imported pharmaceutical products (Shlyk 2014).

Therefore, one of the main tasks of the state in the pharmaceutical industry remains to achieve 50% of the domestic market supply of pharmaceutical products of domestic production. In this regard, the decisive tasks of the state on the formation of the pharmaceutical market in Kazakhstan are:

- modernization of existing industries and the construction of new pharmaceutical enterprises in the framework of investment projects;
- introduction of international quality standards (GMP) at the enterprises of the pharmaceutical industry;
- creation of conditions for the import substitution of pharmaceutical and medical products based on modern technologies in accordance with international GMP standards;
- providing industry with qualified personnel.

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## Strategic Management and Development Market of Dairy Products on the Basis of Increasing Domestic and Innovation Production

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### Abstract:

In the structure of human nutrition, milk and its processing products play a special role. Currently, the tendency to increasingly meet the needs of the population in dairy products due to their industrial production has a steady growth, and the market is mainly formed by dairy processing enterprises.

This article discusses the analysis of the capacity of the Kazakhstan dairy market, which showed that it has potential growth reserves in terms of consumption and production. Nevertheless, the functioning of domestic dairy processing enterprises is connected with both the long-standing problems of the industry, which became aggravated during the crisis, and with the current financial and marketing problems arising under the conditions of the Customs Union. In this connection, a state branch program has needed to develop the production and processing of milk, popularize dairy products, and need government support so that Kazakhstan's dairies and manufacturers can upgrade technologies, modernize equipment, and improve the range and train personnel with the help of innovative methods strategic management.

**Keywords:** production; innovation; investment; strategic management; food industry; import-export

**JEL Classification:** M31; O31; O33

### Introduction

A prerequisite for the development of the food industry is an innovative focus on production technology. In modern conditions, only those enterprises can be successfully developed that promptly detect changes in social needs in the dairy industry, systematically and consistently use the opportunities generated by the continuous development of science, technology and technology, production and management.

The adoption of flexible emergency decisions in a constantly changing external environment is impossible without a well-established system of strategic management. The lack of strategic approach to the industrial production management system makes it impossible to efficiently use the production potential available in this sector, which has currently characterized by a low level of modernization of equipment and technology and insufficient investment activity.

One of the serious problems of the dairy industry at the present stage is the insufficient use of modern development and management strategies in their activities. In connection with the expansion of computerization and the penetration of the Internet in all areas of activity, many organizations are trying in parallel with the traditional way of doing business to master IT technologies to improve the efficiency of sales, procurement, marketing, management and warehousing activities.

### 1. Research Background

The study has based on theoretical positions in the field of strategic management and development of the dairy market in Kazakhstan based on increasing domestic production and technological modernization of the industry, as evidenced by numerous studies of classical and modern domestic and foreign authors, as well as data provided by official sources of the Statistics Committee of the MNE RK, State Revenue Committee of the Ministry of Finance of the Republic of Kazakhstan, mother Proceedings of the Dairy Union of Kazakhstan, the data of the Department of Agrarian Policy.

According to the Message of the President of the Republic of Kazakhstan "100 concrete steps to implement the five institutional reforms", the dairy industry is one of the leading sectors in the industrial structure of Kazakhstan.

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This confirms the fact that, in terms of the nation, “100 concrete steps to implement the five institutional reforms” has indicated to attract strategic investors to develop the production of milk and dairy products. One of the main tasks in this industry is to ensure the export of up to half of the products to the markets of the CIS countries for three years (Nazarbayev 2017).

The Nation's Plan “100 Concrete Steps to Implement Five Institutional Reforms” involves attracting strategic investors to develop the production of milk and dairy products (as part of the implementation of the 60th step). At the same time, the main task is to ensure the export of up to half of the products to the markets of the CIS countries within three years. The inclusion of this step in the national plan indicates the important role of the dairy industry in ensuring the economic development of the country.

## 2. Methodology

Currently, many methods have been developed for predicting one time series (Gambarov *et al.* 2010). The goal of such a forecast is to show what results can be achieved in the future if we move towards it with the same speed or acceleration as in the past. The forecast determines the expected options for economic development based on the hypothesis that the main factors and trends of the past period will remain for the forecast period or that can be justified and take into account the direction of their changes in this perspective. A similar hypothesis is advanced on the basis of the inertia of economic phenomena and processes (Frenkel 2015).

Inertia in social and economic phenomena is manifested in two ways: firstly, as inertia of interrelations, *i.e.*, preservation of dependence, correlation of the predicted time from a set of factor signs; secondly, as inertia in the development of individual aspects of phenomena, that is, as some degree of preservation of their characters, rates, directions, variability of the main quantitative indicators over a relatively long time (Fedoseev and Garmash 2015). In order to identify the general trend of growth of socio-economic factors during the analyzed period, the time series is smoothed. This is due to the fact that, in addition to the influence of the main factors on the level of the estimated indicator, there are numerous random factors that cause, thereby, the levels deviate from the trend. The result of this impact is formed by the residual random component. With all the methods of smoothing the time series in order to identify the main trends, they proceed primarily from the actual development of the dynamics during the considered time. The most common method of smoothing time series is the least squares method (Eliseeva *et al.* 2011). The mathematical apparatus of the method of least squares is described in detail in the literature (Dougherty 2016).

The models obtained using regression analysis, allow us to predict the options for the development of economic processes and phenomena, to study the trends in economic indicators, *i.e.* serve as a tool for science-based predictions. The results of the forecast are the source material for setting real economic goals and objectives, for identifying and making the best management decisions, for developing an economic and financial strategy in the future (Smirnov 2016).

The food market, as a structural element of the entire aggregate market, is a system of economic relations emerging in the sphere of production, processing, storage and sale of food. It is directly related to meeting the needs of the population in food, its saturation is largely dependent on direct interaction with other sectors of the consumer market (Gmoshinsky 2012). The economic specifics of the food market are determined by the hierarchy of needs, a high degree of localization and autonomy, the institutional and structural stability of the consumption of its goods, low price elasticity and strategic value at the macro and micro levels (Karenov *et al.* 2015).

The analysis of the capacity of the Kazakhstan market of dairy products showed that it has potential growth reserves in terms of consumption and production (Lukashin 2014). The possibility of consuming dairy products at the level of physiological norms in a wide range, and consequently, an increase in market capacity, is dictated, on the one hand, by positive trends in consumer demand in the country due to the growth of real incomes and, accordingly, the purchasing power of the overwhelming part of the population and its reorientation to products more high-calorie, nutritious and expensive.

In accordance with the data of the Ministry of National Economy of the Republic of Kazakhstan over the past years, stable positive dynamics has been observed in milk production. As can be seen from Table 1, milk production is growing annually.

Table 1. Milk production in the Republic of Kazakhstan

Production	2011	2012	2013	2014	2015	2016	2017
	5.381,2	5.232,5	4.851,6	4.930,3	5.067,9	5.182,4	5.299,96

Source: compiled by authors

Milk is an integral ingredient in the diet of the population in Kazakhstan, so over the past three years, the volume of sales of cow's milk has not changed and amounted to 321.61 thousand tons of milk per year on average. In the structure of demand in recent years there has been a shift towards more economical types, in particular, two-liter milk packaging. This is due to a number of reasons: stable demand, devaluation in the foreign exchange market, a decrease in consumer purchasing power.

According to the calculations of experts and data of the State Revenue Committee of the Ministry of Finance of the Republic of Kazakhstan, the share of imports in the structure of consumption of milk processing products is from 10 to 40%. The main countries supplying the specified dairy products to the market of Kazakhstan are the Russian Federation, Kyrgyzstan and Belarus. However, in general, over the past two years there has been a decrease in milk imports in US dollars (Table 2).

Table 2. Milk import in the Republic of Kazakhstan

Production	2011	2012	2013	2014	2015	2016	2017
	10.460,886	6.786,66	114,177	1.682,495	1.250,215	1.692,397	1,836

Source: compiled by authors

It should be noted that compared to other member states, Kazakhstan is in a better position - the state policy is aimed at large-scale production with highly efficient technologies, which allows the processing enterprises to provide high-quality raw milk and produce products that are competitive not only domestically, but also in the foreign market.

The main task of manufacturers in the country is to compete with foreign companies by increasing the supply of high-quality goods at reasonable prices and, accordingly, increasing innovative activity in the field of technologies for the production of milk and dairy products.

Most of the domestic milk is not suitable for deep processing due to poor quality; the system of procurement, transportation, storage and sale of raw materials is not so well developed in the country. As a result, the current situation still leads to the import-dependent industry positions of dairy products. Therefore, one of the priority areas for import substitution should be the further deepening of industrial cooperation in the EAEU area, including the creation of joint ventures. In addition to import substitution, there is a task to solve a number of problems impeding the development of competitiveness of milk production in the EAEU, the main of which are:

- seasonal price fluctuations
- underdevelopment of transport and engineering infrastructure,
- lack of funds from agricultural producers for the modernization of dairy complexes.

### 3. Case studies

The introduction of an additional state support measure in the form of compensation for the direct costs incurred for the creation of new dairy farming facilities and their reconstruction will help to increase the investment attractiveness and competitiveness of dairy cattle breeding. Conducting targeted work on solving the above problems will ensure a favourable investment climate in the industry and achieve an optimal level of saturation of both the Kazakhstan market and the external market.

If we consider the structure of the industry, here I would like to note that the presence of personal farmsteads, which are the main suppliers of milk to the factories of the manufacturer, dominates. Such suppliers provide poor quality milk, insufficient production volumes and lack of packaging for transportation.

Therefore, we will conduct a regression analysis, which we will begin our analysis with the null hypothesis ( $H_0 = 0$ ), suppose that with a 95% probability the regression is statistically insignificant ( $F < 5.40$ ), which means there is no relationship between the factors and there is no effect of all the listed independent factors on milk imports, which suggests that it is impossible to control the cost of imported milk, the hypothesis 1 ( $H_1 \neq 0$ ) about the statistical significance of the regression is assumed for refutation.

Baseline data for linear regression analysis: import - Y, production - x1, population - x2, tariffs - x3.

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 \quad (1)$$

Table 3. Baseline data for the regression analysis for the period from 2011 to 2017

Years	Milk production (thousand tons)	Population of Kazakhstan (thousand people)	Kazakhstan import tariff for milk (%)	Import (thousand USD)
2011	5,381.200	16,222.7	0.168	-10,460.886
2012	5,232.500	16,463.2	0.168	-6,786.660

Years	Milk production (thousand tons)	Population of Kazakhstan (thousand people)	Kazakhstan import tariff for milk (%)	Import (thousand USD)
2013	4,851.600	16,698.1	0.168	-1,414.177
2014	4,930.300	16,934.1	0.168	-1,682.495
2015	5,067.900	17,187.0	0.168	-1,250.215
2016	5,182.400	17,439.3	0.168	-1,692.397
2017	5,299.966	17,693.5	0.150	-1.836

Source: compiled by authors

According to the results of calculations, the coefficients were determined, which will allow to make a forecast for the next period.

$$y = -15,507.12 - 11.68b_1 + 5.152b_2 - 91,502.25b_3 \quad (2)$$

Table 4. Regression coefficients

Factors	Coefficients
Intercept	-15,507.12485000
Milk production (thousand tons)	-11.68450258
Population size (thousand people)	5.15206676
Import tariff for milk (%)	-91,502.25306000

Source: compiled by authors

According to the results of our calculations, we can formulate conclusions as follows:

- with an increase in milk production by 1000 tons, the cost of import will decrease by 11.68 thousand US dollars, with an increase in population by 1000 people, the cost of import will increase by 5,152 thousand US dollars, with a 1% increase in tariffs, the cost of import will decrease by 91,502, 25 thousand US dollars;
- the probability of accuracy of this forecast is quite high (above 95%) and the Fisher criterion is greater than the tabular value of 5.4 and is 154, allowing us to refute the supposed null hypothesis of a statistically insignificant regression and accept hypothesis 1 on the statistical significance of the regression.

Next, we analyse the correlation coefficient - the level of interrelation of factors among themselves.

Table 5. Correlation coefficients

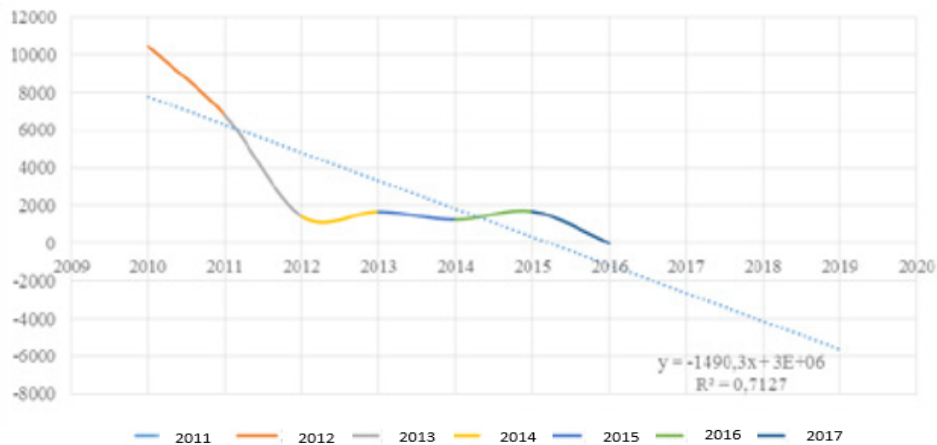
Factors	Milk production (thousand tons)	Population size (thousand people)	Import tariff (%)
Milk production (thousand tons)	1		
Population size (thousand people)	-0.035599372	1	
Import tariff (%)	-0.374281714	-0.621393654	1
Import (thousand USD)	-0.559355435	0.837034090	-0.384464588

Source: compiled by authors

The strongest and most direct correlation between population and import factors is 83%, the average feedback between production and import factors is 55% and the population is 62% tariff, the other factors interact less well, but there is feedback: import tariffs 38 %, production-tariffs 37% and production-population almost have no connection, only 3%. We conducted a trend analysis of the cost of importing milk to Kazakhstan for the period from 2011 to 2017 (Figure 1)

The graph of imports in Figure 1 shows a certain decline in imports of dairy products in Kazakhstan from year to year, and the formula for this dynamic predicts an annual reduction in expenditures on imports by 1,490 thousand US dollars, this is the prospect for the next 3 years to 2020. This fact indicates that Kazakhstan has a technological potential for the production of milk and dairy products, and it is necessary to develop it in this industry. As the population grows, the demand for milk will grow in the forecast period. Milk consumption has expected to increase. Flavoured dairy drinks will remain the main product for children, but retail sales and sales are expected to increase as the number of children in Kazakhstan increases.

Figure 1. Trend analysis of milk import indicators in Kazakhstan for the period from 2011 to 2017



Source: compiled by authors

Thus, in accordance with the data of the customs information portal, a decrease in milk imports into the country can be expected. Some preliminary forecasts about a possible sharp increase in imports of dairy products after Kazakhstan joined the WTO, most likely will not come true. The same picture was observed in the Russian Federation. However, it is necessary to meet the growing demand for milk by increasing domestic production and technological modernization of equipment and technological process for the production of milk and dairy products. The main competition has expected from the EurAsEC member countries. A number of measures may be proposed here. One of them is the attraction of foreign investment in the country's agriculture. The Ministry of Agriculture has data on the export of Kazakh dairy products (Table 6).

Table 6. Export of dairy products

Indicators	January-April 2016		January-April 2017		The volume of 2017 to the volume of 2016
	tons	US dollars	tons	US dollars	
Processed milk	2,5	1,3	4,5	2,5	increase to 75,7%
Dairy products	1,3	836	2	1,8	increase to 54%
Butter	33,3	92,5	121,7	285,5	increase to 3,6%
Cheese and curd	343,3	640,9	374,2	1,5	increase to 9%
Ice cream	67,6	146,6	45,5	106,3	increase to 32,7%

Source: compiled by authors

According to the ministry, most of Kazakhstan's dairy products were shipped to Russia, Kyrgyzstan and Turkmenistan.

In January-April 2017, the export volume of processed milk to Russia amounted to 3.7 thousand tons for the sum of \$ 1.87 million. In addition, Kazakhstan supplied 1.6 thousand tons of fermented milk products for \$ 1 million, 71.9 tons of butter for \$ 271, 3 thousand and 286.3 tons of cheese and cottage cheese for \$ 1.2 million. For the same period, they sent to Kyrgyzstan: 258.6 tons of processed milk for \$ 212.2 thousand, 285.7 tons of dairy products for \$ 447.7 thousand, 49.8 tons of butter for \$ 14.2 thousand and 61.9 tons of cheese and cottage cheese for \$ 176.9 thousand. In addition, Kazakhstan exported 519 tons of processed milk to Turkmenistan. The ministry also reported on the interest of enterprises in the export of dairy products to China.

According to official data, today there are 148 milk processing enterprises operating in Kazakhstan. Of these, 5.4% are large, 29% are medium and 65.5% are small. Over the past five years, seven new enterprises have emerged: two in the Akmola region, one in Aktobe, one in Almaty, one in East Kazakhstan and one in South. The total capacity is 1.8 million tons of milk per year, of which 72.6 thousand tons accounted for the ones opened in the last five years. The total load is 60%, in 2015 this figure was 58%. Domestic enterprises provide the domestic market with dairy products at 92% with a total demand of 5.77 million tons. Kazakhstan processed milk covers 95.6% of the need, fermented milk products - 86%, butter - 66%, cheese and curd - 56%.

There are no clear leaders on the Kazakhstan market - each company is strong in its segment. By the beginning of the crisis, the dairy market was saturated and already divided by major players, domestic and foreign. According to the Dairy Union, the leaders for UHT milk are:



- domestic manufacturers:
  - LLP Raimbek Agro with the Ainlayyn brand, occupying about 30% of the market;
  - LLP Agroprodukt (leading brand Mumunya - 20% of the market);
  - LLP RG Brands Kazakhstan - ("My" - 14%);
  - JSC Company FoodMaster, which in 2004 was acquired by the French company Lactalis, which is the second most powerful manufacturer of dairy products in Europe, - (brands "Cow", "Domashnoe" and a share of about 10%),
- foreign manufacturers:
  - Wimm-Bill Dann - Kyrgyzstan ("House in the Village" and "Merry Milkman");
  - Unimilk - Russia, which have approximately 8% of the market.

In the segment of pasteurized milk, market shares are relatively evenly distributed among Kazakhstani producers, and the leaders in this sector are:

- FoodMaster with 29% (including 14% of Pavlodar Day JSC, which in 2008 was acquired by the FoodMaster company);
- LLP DEP (Kostanay), occupying 14%;
- LLP Vostok-Milk accounts for 12%;
- JSC APK Adal - 10%.

In 2010, Danone, the world's largest producer of dairy products with a 12% global market share, joined these enterprises, investing 21 million euros (4.2 billion tenge) in the construction of its first plant in Kazakhstan with a capacity of 24 thousand tons dairy products manufactured under the brands "Activia", "Rastishka" and "Danone".

The materials of the Dairy Union of Kazakhstan inform that the functioning of such giants, on the one hand, allows them to consume high-quality products and a wide range, and on the other hand, can lead to increased competition and monopolism, unjustified price increases. It is clear that their presence in the republic creates high barriers to entry into the dairy market.

In addition, there is a danger that other Kazakhstani manufacturers may give up their positions in the conditions of the Customs Union. In connection with the elimination of barriers to the movement of products between countries, the expansion of high-quality Russian and cheap Belarusian dairy products is possible, there is a considerable temptation for their producers to take advantage of the opportunities that have opened up and become more active. Accordingly, our milk processors will face tough competition. In addition, an increase in import duties may adversely affect the activities of those enterprises that use imported raw materials in their production. In addition, with the current almost double difference in taxation of business in Kazakhstan and Russia, a scenario is quite possible, in which businesspersons will massively make production on the territory of our country. This will also lead to competition, reduced food security, although there is a likelihood of an influx of both investment and the emergence of jobs.

Thus, we can conclude that the functioning of domestic dairy processing enterprises is associated with both long-standing problems of the industry, which became aggravated during the crisis, and with the current financial and marketing problems that arise in the conditions of the Customs Union, therefore:

- a state sector program has needed to develop the production and processing of milk and the popularization of dairy products;
- state support has needed so that Kazakh dairy plants can upgrade technologies, modernize equipment, improve the range and prepare personnel.

Along with attracting investment and modernization in dairy production, the implementation of a national plan step involves ensuring the high export potential of the dairy industry. For the development of this potential, first, it is necessary to increase the production capacity of the industry, expanding the raw material base of the dairy industry. In this regard, work is underway to create dairy farms. It has expected that thanks to such farms, the production of milk in organized farms will be increased by 2020 by 500 thousand tons, by 2025 - by 1 million tons. According to a number of experts with the help of rural cooperatives, domestic milk producers will be able to withstand competition from foreign producers as part of WTO membership. Purchase of expensive equipment, feed for livestock, fertilizers, and effective cattle breeds will be available, and increased processing of high-quality milk will be increased.

According to the new scheme, all market actors (large companies and small producers) will have equal conditions for development and increase of profitability. Ultimately, because of reforms, medium and large agricultural producers will prevail in the country's agricultural structure.



We would also like to note that in the development of dairy producers within the framework of membership in the WTO, an important issue was the scale of state support in the form of subsidies. Because of the negotiations, Kazakhstan defended the right to provide state support to agriculture for 8.5% of the gross value of agricultural products. We clarify here that only Kazakhstan and the PRC, which joined the WTO, were allowed to apply this level of state subsidies.

According to the obligations, the state can no longer provide transport (export) subsidies to producers; VAT exemption for domestic agricultural producers and agricultural processors must be eliminated before January 1, 2018. As the data of the department of agro-industrial policy show, the volume of foreign direct investment in agriculture is small. This sector remains not quite attractive because there are problems with logistics and the lack of interest of banking organizations in investing in agricultural production.

The implementation of a step of the nation's plan to increase the export of dairy products in the short term is possible on the condition that the material and resource base and production equipment and agricultural machinery are created, since domestic milk producers are not able to withstand competition from foreign producers due to the fact that the existing agricultural equipment is outdated, and the new technology is not available to many domestic manufacturers. In this regard, the state support system remains relevant. The target program for the development of the agro-industrial complex in the Republic of Kazakhstan for 2013-2020 "Agribusiness 2020" has aimed at solving a number of the above problems.

## Conclusion

In general, today we can say that foreign investors show a certain interest in the agriculture of our country. For example, in Akmola region a project has been implemented with the participation of a German company for the construction of a complex of dairy farms and a milk processing plant.

Along with attracting investment in dairy production, the implementation of the 60th step of the national plan involves ensuring the high export potential of the dairy industry. For the development of this potential, first, it is necessary to increase the production capacity of the industry, expanding the raw material base of the dairy industry. In this regard, work is underway to create dairy farms. It is expected that thanks to such farms, the commercial production of milk in organized farms will be increased by 2020 by 500 thousand tons, by 2025 - by 1 million tons.

As noted in the national plan, the work on the development of dairy production will be built on the example of the New Zealand Fonterra and the Danish Arla, with the development of cooperative production in the countryside. These manufacturers are the largest cooperative organizations operating on a transnational scale.

Summing up our research, we can conclude that, being an important component in the nutrition of the population, milk is the subject of trade for both developed and developing countries in the global economy.

One of the conditions for overcoming competition from foreign producers is the price of feed, developed equipment and technologies, the availability of pedigree cattle in national milk production, which is impossible without active government support. In the context of Kazakhstan's membership in the WTO, it is not necessary that there be a sharp increase in milk imports because of a reduction in the tariff for the import of this product.

Obviously, to fully adapt to the new conditions of agricultural development requires a long time, a comprehensive analysis at the state level. It is worth considering that, membership in the WTO is not enough to increase and improve trade without corresponding additional institutional reforms.

The problem of quality milk should become a task of national importance, because bacterial contaminated milk poses a threat to public health. In addition, effective government measures (first of all, the system of allowances and discounts for the quality of milk, stimulating the production of quality milk) will increase the competitiveness of dairy products and export them. Therefore, the problem of the fastest exit of the dairy sector from the informal sphere is a matter of principle; it should be solved while strengthening state regulation and support.

Therefore, first, it is necessary to create favorable conditions for efficient, economically viable food production and to supply consumers with high-quality products at prices corresponding to the level of effective demand, *i.e.* ensuring a balance of supply and demand, a balance of interests of producers and consumers. At the same time, the policy of regulating the agrarian market should primarily consist in supporting the agricultural producer, that is, in ensuring economic parity for all market participants: agricultural producers, processors, importers of raw materials and finished products, wholesalers.

Price control avoids the dictates of processors in relation to rural producers and contributes to market stability, streamlined marketing, and improved financial sustainability. Price control also stimulates an increase in the culture of production, the desire to produce more high-grade products.

Thus, a number of measures are currently being implemented aimed at attracting investments in dairy production and developing its export potential. However, a lot of work still needs to be done to successfully complete

the corresponding step of the National Plan. At the same time, success can be achieved only under the condition of attracting investments, taking into account national interests and the socio-economic effect of project implementation, both in the short and long term.

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## The Impact of Public Expenditure and Efficiency for Economic Growth in Indonesia

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### Abstract

The aim of this study is to examine the impact of public expenditure and efficiency to economic growth of regencies and cities in Java, Indonesia in the period of 2011-2016. This study employs secondary annual data on education expenditure, health expenditure, gross fixed capital formation, inflation rate, population growth, and per capita gross regional domestic product as obtained from Central Bureau of Statistic (BPS) and Autonomy Directorate General in Ministry of Finance (DJPK). Fixed effect model was applied for a sample of 73 regencies and cities in Java, Indonesia. The study results present that the increase in public expenditure will improve the economic growth of regencies and cities in Java, Indonesia. The study results also demonstrated a fact when the public expenditure is intercommunicated with the government efficiently; the positive evidence for government involvement in leading the impact of public expenditure on economic growth becoming unnecessary. Based on this study result, fiscal policy maker of regencies and cities in Java, Indonesia should consider more for using the expenditure to accelerate the economic growth.

**Keywords:** public expenditure efficiency; growth; fixed effect model

**JEL classification:** H51; H52; H54; O11

### Introduction

The debate of government involvement in economic system and its outcome has long been a history since the Keynesian and Neo Classical eras (Danu Prasetyo and Zuhdi 2013). This involvement is corrected by market economy nature. It is an existed belief that, when market is not perfect, the government involvement is; therefore, needed to reduce the distortions derived from the market failure. The objective of replacing the economic system is to reach efficiency and economic growth (Danu Prasetyo and Zuhdi 2013). Nevertheless, when justifying the market imperfections, the government is not needed to substitute the workings of the market system preferably to compensate for its shortage (Danu Prasetyo and Zuhdi 2013). Even as the government aims to reach better efficiency by means of replacing the workings system of the economy, it is an opinion that the government intervention might cause the replacement of private sector performance as the effect of crowding out (Danu Prasetyo and Zuhdi 2013). In most matters, the increasing of public expenditure in developing nations leads to the crowding out of private investment. In consequence, the whole process slows down the economic growth (Chang, Huang and Yang 2011). Despite all of these discussions, the opinion, whether government expenditure supports positively towards economic growth, had become an accepted keynote in almost world economies over time (Danu Prasetyo and Zuhdi 2013). Throughout this hypothesis, for the public expenditure to have meaningful contribution to the country's economic growth maximum efficiency in all resource allocations is very essential. The relationship between the public expenditure and the economic growth indicates various outcomes which are affected by the efficiency level (Rahmayanti and Horn 2011). The government performance towards economic growth is more

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meaningful along with the promotion of government accountability (Hauner, Kyobe and Fund 2010). Public expenditure becomes an input which demands maximum efficiency in distributions to smooth or speed economic growth. Thus, maximization of the growth requires more attention simultaneously of public expenditure and the government efficiency level in resource distribution.

In Indonesia, the government spending has continued to rise annually. Available statistic data present that total government expenditure (capital and recurrent) and its components have continued to rise in the last six years. For instance, government total recurrent expenditure increased from 201,991,751 million in 2010, to 338,698,797 million in 2013 and further to 511,339,197 million in 2016. On the other hand, government capital rose from 241,573,417 million in 2010, to 361,988,009 in 2013 and capital expenditure stood at 422,369,662 in 2014 and 577,116,794 in 2016 respectively.

However, the increase of the government expenditure may have not been translated to meaningful growth and development, as Indonesia rank is still among the middle low income countries in the world. In addition, the economic growth explored by economists of Indonesia was not balanced with the state budget which had an increase of 100% every 10-year period. Furthermore, macroeconomic indicators like inflation rate, balance payments, import obligations, exchange rate, and national saving reveal that Indonesia has unexpectedly progressed in the last five years.

It is an unfortunate fact that the increasing of government expenditure seems have not been replicated at the same level of economic growth in Indonesia (between 2010 and 2016), while the GDP growth rate was decreasing (6.38% down to 5.03%); while the government expenditure growth rate was increasing (15% to 27.1%). Thus, the government expenditure growth rate has been greater than GDP growth in the same period demanding the inverted relationship between the two periods.

In consequence of the mixed assumption previously presented, this study finds out whether increasing public expenditure would accelerate the economic growth of regencies and cities in Java Indonesia. The study also examines whether government efficiency is considered as an accelerated breakthrough for encouraging the impact of public expenditure on economic growth. Hence, this study answers the two research questions as follows: Firstly, how are the impacts of public expenditure on the economic growth of regencies and cities in Java, Indonesia? Secondly, does the government efficiency encourage the public expenditure on the economic growth of regencies and cities in Java, Indonesia?

The rest of the paper is organized as follows: section 1 provides a literature review including on the relationship of public expenditure, efficiency and economic growth, section 2 presents the research method being used in this study to answer the two research questions, section 3 presents, discusses and interprets the empirical result and last section provides the conclusion and the implication of the study.

## 1. Literature review

### 1.1. Overview of public expenditure, efficiency and economic growth

The evaluation of public expenditure efficiency as the measurement of government performance remains a relevant issue. It is still not only at the academic and political debate in the public sector but also becomes one of the main issues in public finance (Inverno, Carosi and Ravagli 2017, Hauner and Fund 2008). To date, numerous studies which relate public expenditure and economic growth have produced different results. Some researches, such as: (Osborn 2007, Govindaraju, Rao and Anwar 2011, Yahya *et al.* 2012, Minh Quang Dao 2012, Okoro 2013, Patricia and Izuchukwu 2013, Chipaumire 2014, Al-Fawwaz 2016, Ebong, Ogwumike, Udongwo and Ayodele 2016, Oladele, Mah and Mongale 2017, and Wanjuu and le Roux 2017), generally conclude that the increasing public expenditure leads to the economic growth. Other researches like (Onuorah, A.C 2012, Rashid Mohamed, Singh Jit Singh and Liew 2013, Ahmad and Othman 2014, Chipaumire 2014, Hasnul 2015, Idenyi, Ogonna and Chinyere 2016, Kaakunga 2006) proved that increasing the public expenditure conversely turned down economic growth while some studies like (Sinha 1998, Kollias, Manolas and Paleologou, 2004) explained insignificant relationship between public expenditure and economic growth. Referring to such various opinions, it is sensible to decide that the relationship between public expenditure and economic growth remains unconvincing.

It is an existed point of view that in order to reach robust result when examining the impacts of public expenditure on economic growth, the government efficiency must be thought over (Rahmayanti and Horn 2011, Mandl, Dierx and Ilzkovitz 2008, Angelopoulos, Philippopoulos and Tsionas 2008). The economic growth not only depends on public expenditure but depends also on the capability of the government to distribute its public resources and efficiency. The maximization of growth needs collectively consciousness of public expenditure and efficiency (Angelopoulos 2008). Based on this opinion, it is rational to decide that public expenditure and efficiency are inevitable if the nation or countries desire to reach better economic growth through public expenditure.

## 1.2 Government efficiency and economic growth

The question of government efficiency becomes one of the essential point issues. The question which arises more is: what is government efficiency? and where is it from? (Kimaro, Choong and Sea 2017). In the face of focusing on relationship between government efficiency and economic growth, it would be principal to have a concise meaning of institution as the general or universal set by which the government efficiency is initiated.

In a human manner, institution is viewed as the formalized restraint which designs human being synergies. Related to the concept of institution, physical engineering is recognized as the social technologies in the process of productive economic activities involving any human being interactions and deciding the persuasion (Law and Habibullah 2006). From the institutional point of view, market is not regarded as the physical environment of economic appearance, yet it is social institution which depends on the progress of accurate rules and norms (Hodgson 2016). Thus, the institutions are acted as the regulation in the economic play which dictates the interactions among the economic agents (Law and Habibullah 2006).

Afterwards, how do the institutions implement and influence the economy? The quality of the institution is considered essential in the economic system as they produce economics synergies. Institution quality confirms performance standards among various economic agents. From the science or knowledge pours, the outlook exists via the spillovers of technologies transmission, quality of institutions in the perspective of government regulations quality and the confident relationships which are contributed by the socio-cultural economic groups as well as are intermediated by the organization to integrate better market and technological convergence (Kimaro *et al.* 2017). South Korea is an instance to prove that the quality of the institutions supports technological convergence among various manufacturing companies like Hyundai and Samsung which deal with a supply of automobiles and electronics successively (Rasiah 2011). To date, it has been found that government efficiency is the result of the quality of institutions (Radaelli and Francesco 2010). Government efficiency, effective government and the quality of governance are used to indicate the ability of the government to organize and to carry out the sound policies which have positive impact in the economy. Afonso, Schuknecht, and Tanzi (2008) explained the meaning of government efficiency as the ability of the government to invest its public resources in order to create public goods and services which advantage in the economy and lead the economic growth. Better quality of the institutions confirm more effective government which distributes the public resources more efficiently and encourages the economic growth (Law and Habibullah 2006)

## 1.3 Public expenditure and economic growth

The question which arises is: does the increase in public expenditure usually speed economic growth? If the increase in public expenditure maintains economic growth, then some various factors such as efficiency and source of finance to provide facilitate that expenditure will also be worth considering (Riedl 2008, Lorena Cakerri, Migena Petanaj, and Oltiana Muharremi 2015). In addition, Lorena Cakerri, Migena Petanaj and Oltiana Muharremi (2015) point out that more and more of the process of increasing the public expenditure related with borrowing financial resources from private investors, does not support new spending power in the economy which is vital for economic growth. Government loaning from the private investors finishes at the redistribution of the existing income rather than produces any new productive projects which later smooth the economic growth. The growth of economic is not pushed by allocating among wealthy individuals in the nation; it is preferably supported by new spending power. Enlarging government expenditure which attracts competition between private and public sector on the available credits motivates tension in the credit market; thus the result is raising the interest rate.

In the neo classical growth models argue that higher government expenditure may slowdown overall performance of the economy. For instance, in an attempt to finance rising expenditure, government may increase taxes and or borrowing. Higher income taxes discourage individual form working. This is in turn reduces income and aggregate demand. In the same vein, higher profit tax tends to increase production costs and reduce investment expenditure as well as profitability of a firm. Moreover, if government increase borrowing (especially) from the banks) in order to finance its expenditure, it will compete (crowds out) away the private sector, thus reducing private investment. In fact, studies by (Landau 1986, Barro, Quarterly and May 1991, Engen 1992, Stefan Folster 2001) suggested that large government expenditure has negative impact on economic growth.

But, in Keynesian model, increase in government spending will have a tendency to run into higher aggregate demand and ensure a rapid increase of economic growth. Government performs two functions; protection and provisions of certain public goods (Al-Yousif 2000). Protections function consists of the creation of rule of law and enforcement of property rights. Provisions of public goods are roads, education, health, defence and power. Some scholars argue that increase in government expenditure on social economic and physical infrastructures encourage economic growth. For example, government expenditure in health and education raises the productivity of the



labour and increase the economic growth. Similarly, expenditure on infrastructure such as roads, communication, power, etc., reduces production costs, increase private sector investment and profitability, thus fostering economic growth (Nurudeen and Usman 2010). Supporting this view, scholar such as (Al-Yousif 2000, Cooray 2009), concluded that expansion of government expenditure contributes positively on economic growth.

#### 1.4 Empirical relationship between public expenditure and growth

The impact of public expenditure has been analysed widely, but the results are inconclusive. For instance, Oladele *et al.* (2017) analyse the contribution of government spending towards economic growth in South Africa by using annual data from 1980-2016 and by applying Vector Error Correction Model. The result presents that there is a positive significant relationship between government expenditure and economic growth on the long run in South Africa, while on the short run, there is a negative and significant relationship between government spending and economic growth. Khusaini (2016) analyse the effects of public sector expenditure towards local economic development in East Java, Indonesia by applying the method of the path analysis. The results showed that public sector expenditure has a direct positive effect on local economic development, but not all public sector expenditure indicators have an indirect effect on local economic development. Indirect effect occurs through spending on education and health sectors.

However, Corsetti (2013) identifies the effects of the two economic components of the government spending which are the country capital and the country current spending per capita of economic growth in Latin America countries over period of 1975 to 2000. The study employed GMM method and found that government spending brought no impact on the economic growth in the long term. Similarly, Connolly and Li (2016) employ a generalized method of moments with fixed and random effects panel data from 1995 to 2011 for 34 OECD countries. The study examines the effects of government consumption spending, public spending and public investment as the independent variables. The study results found that the increasing the public spending has a significant negative effect on economic growth; meanwhile, government consumption spending and public investment have no significant effect on economic growth.

#### 1.5 Empirical relationship between government efficiency and growth

Related to the significance of government efficiency in accelerating the impact of public expenditure on economic growth, (Hauer *et al.* 2010) GMM and panel data were applied for 114 countries. The findings showed that the efficiency increases the effects of the government expenditure, in which higher income countries show better public sector. Thus, the study concludes that efficiency and the status of income are closely interlinked each other. Additionally, Butkiewicz (2011) states that if the government is less efficient, the government expenditure indicates to slow down the economic growth. Consistent results which support the significant of efficiency to boost the effects of public expenditure on economic growth are also explored by Rahmayanti and Horn (2011) examining the relationship among government expenditure, efficiency, and economic growth. The study uses panel data of 63 developing economies. The results show that government efficiency has effect on government expenditure to accelerate the economic growth. More results which support the role of efficiency to boost the effects of public expenditure on economic growth are also reported by Angelopoulos *et al.* (2008) who states that getting a robust impact of overall government expenditure on economic growth without expenditure-efficiency is tedious. This statement is consistent with the hypothesis of Rahmayanti and Horn (2011) who also give comment that efficiency is imperative when examining government expenditure and its impacts on economic growth.

## 2. Research method

### 2.1 Object of research

The objects of this study are 73 regencies and cities in Java, Indonesia in the period of 2011 to 2016. Those provinces are selected based on: 1. Geographical location, the provinces are expected to denote provinces located on Java Island due to their proximity to the central expenditure and centre of economic; 2. Population, the largest population is used as a criterion in selecting the province; 3. Economic Growth, selected province has a lower regional economic growth after decentralization compared to regional economic growth before decentralization. Based on several considerations as described above, regencies/cities in Central Java and East Java are selected as an object in this study. Both Central Java and East java have the largest population compared to other provinces in Indonesia. Both Central Java and East Java have lower regional economic growth after decentralization than before decentralization.



## 2.2 Sources of data and description of variables

This study uses secondary data which are collected from several publications of Central Bureau of Statistics (BPS) and Autonomy Directorate General in Ministry of Finance (DJPk). Accordingly, the variables which are involved in this research are GDRP per capita ( $y_{it}$ ) to denote economic growth used as a dependent variable. Control variables are as follows; Gross Fixed Capital Formation is measured as a percentage of GDRP to denote physical capital stock ( $k_{it}$ ); growth rate of population to denote growth of labor force ( $l_{it}$ ); inflation ( $cp_{it}$ ) in order to catch the effectiveness of monetary policy; public expenditure for education and health expenditure ( $g_{it}$ ) is measured as a percentage of GDRP and government effectiveness ( $eff_{it}$ ) used as a proxy for government efficiency and an interaction term with government expenditure for education and health. To obtain a measure on government efficiency, the researchers follow the methodology of Kumbhakar and Lovell (2000) as an approach in measuring government efficiency. By estimating a stochastic production frontier for the public sector, the model form is as follow:

$$\ln y_i = \beta_0 + \ln \beta_1 x_i + v_i - u_i \quad (1)$$

where:  $y_i$  is a measure of public sector output in regency or city  $i$ , the average of the public sector performance index as a measure is  $y_i$ . If  $x_i$  is a measure of public sector input, total public expenditure (as share of GDRP) is applied which is available from Autonomy Directorate General in Ministry of Finance. Next,  $u_i$  is nonnegative technical inefficiency component or an error term, and  $v_i$  is the noise component assumed to be distributed normally and independently of  $u_i$ .

## 2.3 Method of analysis

The panel data methods which used include: common effect, fixed effect and random effect. Determining which model suits the best in the study is conducted by testing the suitability of the model. Therefore, to estimate a suitable model selection, several following stages are employed:

- *Chow Test*: This test is conducted to choose a suitable model between common effect and fixed effect models. The hypothesis that is formed is:

$H_0$ : Common effect model

$H_1$ : Fixed effect model.

The first step is to establish panel data regression with common effect method and subsequently with the fixed effect model. The test result is as follows: if the value of Chi-square probability or the value of F-test probability is less than ( $<$ ) 0.05 then  $H_0$  is rejected; thus, the right model is a fixed effect model, and vice versa.

- *Hausman Test*: This test is used to choose the right model between the fixed effect model and random effect model. The hypothesis which is formed is:

$H_0$ : Random effect model

$H_1$ : Fixed effect model.

The first step is to establish panel data regression with fixed effect model followed by random effect model. The test result show that in case the probability value of random effect is less than ( $<$ ) 0.05 then  $H_0$  is rejected, in which the right model is a fixed effect model, and vice versa.

## 2.4 Model specification

This study applies the two different models in order to test the impacts of government expenditure (education and health expenditure) and efficiency on economic growth of regencies and cities in Java Island, Indonesia. Model one examines the effects of government expenditure (expenditure in education and health) and other control variables without the involvement of government efficiency. Model two examines the effects of government expenditure and other control variables including efficiency of the government. Therefore, model two examines the capability of the government to manage or to organize the suitable policies intending at right distribution of public resources and its impact on growth. The two models are described as follows;

### 2.4.1 Model one

$$y_{it} = \beta_0 \sum_{i=1}^4 \beta_i x_{it} + \varepsilon \quad (2)$$

where:  $y_{it}$  denotes economic growth.  $X$  stands for control variables which are as discussed in section 2.2 above, which are the physical capital stock ( $k_{it}$ ), growth of labor force ( $l_{it}$ ), inflation rate ( $cp_{it}$ ) and public expenditure in terms of education and health expenditure ( $g_{it}$ ).

Although the relationship between economic growth and its explanatory variables is linear, this study employs natural logs and implements the growth model forming the equation (1) as follows:

$$\ln Y_{it} = \beta_0 + \beta_1 \ln k_{it} + \beta_2 \ln l_{it} + \beta_3 \ln cpi_{it} + \beta_4 \ln g_{it} + \varepsilon_{it} \quad (3)$$

From the equation (3), public expenditure influences economic growth of regencies or cities in Java Indonesia as follows;

$$d \ln y_{it} = \beta_4 d \ln g_{it} \quad (4)$$

$$d \ln y_{it} / d \ln g_{it} = \beta_4 \quad (5)$$

This equation (5) examines the influence of public expenditure on economic growth of regencies and cities in Java Island, Indonesia. This estimation answers the research question as stated in section 1.

#### 2.4.2 Model two

In order to examine the government efficiency in distributing public resources, this study involves government efficiency in the general growth model as an inter play designation. The objective of the model is to examine the government efficiency in driving the effects of public expenditure on economic growth. Thus, government efficiency is interacted with public expenditure. By intercommunicating public expenditure with government efficiency, this study uses the model two as follows:

$$y_{it} = \alpha_0 + \sum_{i=1}^4 \alpha_i X_{it} + \alpha_5 g_{it} * eff_{it} + \epsilon \quad (6)$$

Although the relationship between economic growth and its explanatory variables is linear, this study uses natural logs and conducts the growth model from equation (6) as follows:

$$\ln y_{it} = \alpha_0 + \alpha_1 \ln k_{it} + \alpha_2 \ln l_{it} + \alpha_3 \ln cpi_{it} + \alpha_4 \ln g_{it} + \alpha_5 \ln g_{it} * eff_{it} + \epsilon \quad (7)$$

From the equation (7), the significance of government efficiency in encouraging the effects of public expenditure towards economic growth is assessed as follows:

$$d \ln y_{it} = (\alpha_4 + \alpha_5 eff_{it}) d \ln g_{it} \quad (8)$$

$$d \ln y_{it} / d \ln g_{it} = \alpha_4 + \alpha_5 eff_{it} \quad (9)$$

Equation (9) presents the significance of government efficiency towards encouraging the effectiveness of public expenditure for preferable economic growth. Therefore, it replies the research question two which is expressed in section 1.

### 3. Empirical results and discussions

This section of this study focuses on presentation, discussions and interpretations of the result of choosing model in panel data through Chow Test and Hausman Test. This section also answers the two research questions.

#### Result of choosing model

In the panel data method, the three methods used include: common effect, fixed effect and random effect. To find out which model is the best in the study, further test is conducted to choose the appropriate model. Chow test is applied to see whether common effect or fixed effect is better by the following steps:

- *Chow Test*. This test is used to choose a suitable model between common effect and fixed effect models. The hypothesis which is formed is:

H<sub>0</sub>: Common effect model

H<sub>1</sub>: Fixed effect model.

Table 1. The result of Chow test

Effect Test	Statistic	d. f.	Prob.
Cross-section F	378.652293	(72,361)	0.0000
Cross-section Chi-square	1,899.851725	72	0.0000

Source: Secondary data (processed), 2018

Table 1 shows that the value of Chi-square probability or the value of F-test probability is  $0.0000 < 0.05$ .  $H_0$  is rejected; thus, the appropriate model is fixed effect model.

- *Hausment Test*. This test is used to select the right model between fixed effect model and random effect model. The hypothesis which is formed is:

$H_0$ : Random effect model

$H_1$ : Fixed effect model.

Table 2. The result of Hausman test

Effect Test	Statistic	d.f.	Prob.
Cross-section random	378.652293	5	0.0000

Source: Secondary data (processed), 2018

Table 2 presents that the p-value as obtained by Hausman Test between fixed effect model and random effect model at the 5% significance level is 0.000. Since p-value is less than the 5% of significance level (0, 05), thus, it can be decided that the fixed effect model is more appropriate to examine the research. Here is the conclusion of the election results from testing the model in the study:

Table 3. Conclusion of model selection

	Prob.	Conclusion	
Chow Test	0.0000	Reject $H_0$	FEM better
Hausman Test	0.0000	Reject $H_0$	FEM better

Source: Secondary data (processed), 2018

### The result of Fixed Effect model

Table 5. Result for Panel Fixed Effect Model

Variables	Model one		Model two	
	Coefficient	Test Statistics	Coefficient	Test Statistics
C	3.329633	29.61934 (0.0000)	3.121559	30.72849 (0.0000)
Ln <sub>lit</sub>	-0.289461	-13.60934 (0.000)	-0.322939	-14.09260 (0.0000)
Ln <sub>kit</sub>	-0.395612	-3.496925 (0.0005)	-0.249763	-2.018584 (0.0443)
LnCPI <sub>lit</sub>	-0.001590	-1.039791 (0.29911)	-0.002109	-1.307364 (0.1920)
Lng	3.84e-08	7.122529 (0.0000)	0.003540	3.912049 (0.0001)
Lng*eff			0.004031	1.895420 (0.0589)
Adjusted R-squared		0.989332		0.986905
Durbin-Watson stat		1.251028		1.321685
Observation		438		438

Source: Secondary data (processed), 2018

Table 5 presents several results: In model one when the government efficiency is not interacted in the growth model, the variable of public expenditure is statistically significant positive at 1 per cent of significant level. However, in model two, when government efficiency is interacted in the growth model as an intercommunication term, the result shows that the intercommunicative term is not significant at all level of significance. The other variables are statistically significant at 1% of significant level but the CPI variable is not statistically significant. These results are confirmed by the exam statistics and p-values which are described in the table.

### *The impacts of public expenditure on economic growth*

Model one demonstrated that the coefficient of public expenditure has a positive sign and significant value as expected by this study. The results state that 1% increase in public expenditure to regencies and cities in Java Indonesia accelerates the economic growth by 3.84%. The findings of positive impacts between public expenditure and economic growth are consistent with (Govindaraju *et al.* 2011, Yahya *et al.* 2012, Sirag, Nor, Adamu and Kher Thing 2016) who conclude that increasing the public expenditure speeds economic growth of Malaysia; (Qi 2016, Zhang and Zou 1998, Chen 2010) who find that increasing public expenditure accelerate the economic growth of China; (Ogundipe and Oluwatobi 2013, Patricia and Izuchukwu 2013, Okoro 2013, Ebong *et al.* 2016) who reveal that the increase of public expenditure on capital expenditure and recurrent expenditure lead the economic growth in Nigeria.

### *The impacts of government efficiency on economic growth*

The signification of government efficiency is performed by the coefficient of intercommunication term *i.e.*, when public expenditure is communicated with government efficiency. The coefficient of communicative term has a positive impact as supposed by this study although statistically it is not significant. This positive coefficient interprets that the government or public expenditure and government efficiency are counterbalance value they carry out simultaneously to smooth economic growth of regencies and cities in Java Indonesia. The results state that 1% increase in public expenditure which is interacted with government efficiency accelerates economic growth by 0.004%. Based on this finding, the government of regencies and cities in Java Indonesia has failed to be effective on the distribution of public expenditure for boosting the economic growth. This finding is consistent with several studies by James Guseh (2000), and Yabbar, Ismail, Santosa, and Susilo (2014) pointing out that the improvement of efficiency level in public sector had not always impacted on the economic growth.

### *The impacts of control variables on economic growth*

In this paper, the rest of the variables related to economic growth of regencies and cities in Java Indonesia are as follows:

- The variable of labour represents the population growth rate. The statistic results show that the coefficient of labor rate has supported the growth theory both in model one and model two. The results show that there is a negative relationship between population growth rate and economic growth. The increase of 1% of population growth rate can inhibit 10% of economic growth. This finding is consistent with the studies by (Fact 2009) and (Emmanuel Nkoa Onggo and Sciences 2014).
- The variable of capital denotes the capital stock. Based on statistical result, there is negative relationship between physical capital stock and economic growth. The increase of 1% of physical capital stock slows down the 0.39% on economic growth when the government efficiency is intercommunicated in the growth model and 0.25% when the government efficiency is not intercommunicated in the growth model. This result is in line with the studies by Onyinye, Idenyi and Ifeyinwa (2017) and Emmanuel Nkoa Onggo & Sciences (2014), when the government efficiency is involved in the growth model, the coefficient of capital stock is also negative. The results show that the increase of 1% in physical capital stock accelerates the economic growth of regencies and cities in Java Island, Indonesia by 29% when the government efficiency is included in the growth model. Furthermore, all models show that the coefficient of inflation has a negative sign related to the expectation of this study. The results show that the increase of 1% of inflation can retard the 0.02% when the efficiency of government is included in the growth model and the 0.01% when the government efficiency is not included in the growth model. This finding is consistent with the studies conducted by Kasid and Mwakanemela (2013) and Madurapperuma (2016).

### **Conclusion**

Government involvement in economic activities of regencies and cities in Java, Indonesia gives spillover advantages. Based on the empirical results of this study, public expenditure accelerates the economic growth of regencies and cities in Java, Indonesia. It is unfortunate fact that the government efficiency does not prove any evidence to speed up the impacts of public expenditure on economic growth in regencies and cities. As a result, the efficiency of the government on regencies and cities in Java, Indonesia was not effective to the public expenditure distribution to accelerate economic growth. Thus, the government of regencies and cities in Java Indonesia has shown imperfection related to the management and the implementation of the suitable policy towards the public expenditure distribution for speeding the economic growth.

Based on these findings, the study proposes that the government of regencies and cities in Java, Indonesia should broaden the public sectors in order to accelerate economic growth. It is expected that the expanding of public sectors involves several factors which can enlarge the government expenditure. Even though the public expenditure increased, the making decision maker, in this case is through the policy should consider some other factors which are important to defend the positive impacts between public expenditure and economic growth in the regencies and cities.

There are some suggestions to note: Firstly, it is very important to inject the power of expenditure in the economy by guaranteeing the external finance and by dissociating the domestic loans to prevent the crowding-out of private sector: Secondly, public expenditure should have a good planning for expenditure, should conduct periodic evaluations to set minimum service standards, should enhance transparency within public sector procurement and should improve supervision function in public expenditure. It is intended that public expenditures can accommodate the budget to produce better service, especially services which are productive in driving regional economic growth. Productive services include: services in education sector, health sector and infrastructure sector. Thirdly, public expenditures should improve the quality of labor with education and training. It is believed that the improvement of the quality of labor will improve productivity and output, as well as will encourage economic growth. Fourthly, it is recommended that the government to dissociate any potential distortions while the taxation is applied to mobilize the government revenues to protect the private sector sustainability. Afterwards, some creations on increasing the society level of spending in public investment can be achieved by diminishing their urgencies when they fund public project. In addition, the efficiency of the government should be considered as a very essential point on economic growth by means of public expenditure; nevertheless, the empirical results of this study have been unsuccessful to verify the hypothesis. Even if the link between the government efficiency and economic growth is positive; unfortunately, the effect on economic growth is not significant. Therefore, the government of regencies and cities in Java, Indonesia should update or correct the institutions targeted to be better in managing and implementing suitable policies which have direct significant impacts on economic growth.

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## Factors of Sustainable Development of the Agricultural Sector in Kazakhstan

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### Abstract:

The agricultural sector of the economy of Kazakhstan is, although not the main, but a very important component of the national economy, it produces products necessary to ensure food security of the state, and in part – for exports.

The purpose of the article is to develop recommendations for the development of the agricultural sector of the Republic of Kazakhstan. The leading methods of research of this problem are the analysis of theoretical sources, statistical analysis and comparison. Statistical analysis is the most important, since data on the state of the agricultural sector of the Republic of Kazakhstan can be directly obtained from the statistical databases of Kazstat and the Ministry of Agriculture of the Republic of Kazakhstan. The existing resource potential of Kazakhstan's agrarian sector allows not only to consolidate the results obtained in recent years, but also to significantly increase the production of high-quality and safe agricultural products, and to increase the export potential of the industry. The materials of the article are of practical value for the development of the agrarian sector of Kazakhstan, for making decisions related to meeting the needs of the population of Kazakhstan in agricultural products and increasing the export potential.

**Keywords:** agrarian and industrial complex; agrarian policy; agrarian sector; agro-industrial complex; food; agriculture

**JEL Classification:** Q13; Q14; Q18

### Introduction

The agrarian sector was historically the most important sphere for the economy of any state, since they provided basic needs of the population for food, in part – export of food products, in many respects the agrarian sector also ensured the country's food security. The Republic of Kazakhstan also has a fairly long history of development of this sector, taking into account the climatic and natural features of the country: vast steppes in the north and in the center of the country that promote the development of cattle breeding (although, since the beginning of the mastering of Celina, these regions of the country have become a center for the development of agriculture, the production of wheat and other crops), as well as the warm climate of the south of the country, which promotes the cultivation of heat-loving crops, including melons (The agricultural sector as the new... 2018). In Kazakhstan, with its large population, there are also significant domestic needs for quality food products, and there is an export potential that is involved in international trade, primarily with the nearest neighboring countries – Russia, China and some others. At the same time, in many countries, including Kazakhstan, an increasingly acute poser become the

problem of the development of this industry, taking into account the problems that are inherent in it, increasing the efficiency of production in it, ensuring the country's food security as an important constituent of economic security (Akhmetshin and Osadchy 2015; Akhmetshin and Vasilev 2016).

At the present stage, the Republic of Kazakhstan has reached the level of development of the agrarian sector, when the world economy is experiencing a slowdown in the development of the economies of most countries oriented to the export of raw materials. The meaning and the role of the agricultural sector, as one of the drivers of the economy, is of great importance and influence for all sectors of the economy of Kazakhstan. The Republic of Kazakhstan was and is currently a country with a significant share in the production of the agricultural sector of the economy. The agricultural sector accounts for a significant number of the employed population of the country, more than in a number of other sectors of the economy. In general, now in the agro-industrial complex of Kazakhstan, about 1/3 of the national income is produced. Support for the agricultural sector, and in particular the food market, is one of the most important tasks of the state (Zhaksybayev 2015).

A number of competitive advantages, which the Kazakhstani agrarian sector has, can serve as a locomotive for development for the entire economy of the country with subsequent integration into the world economy. However, the development of Kazakhstan's agrarian sector is hampered by the high capital intensity of the industry, the length of the payback period, low profitability at the initial stage of production, and the unwillingness of second-tier banks to lend this sector of the economy, associated with high risks, for long-term prospects (Independent analysis of... 2018). Many of the difficulties of the agrarian sector should be resolved through efforts and constructive dialogue of the stakeholders, but the state, its concentrated attention and strong support are the supporting engine of the entire agricultural sector system and the processes occurring in it.

The theoretical significance of the work is to identify the essential and meaningful characteristics of the agricultural sector. The practical importance of the work is to develop specific recommendations for the development of the agricultural sector in Kazakhstan, which can be submitted to the authorities for effective use. The theoretical basis of the work was the fundamental developments on the problem studied, presented in the works of domestic and foreign authors.

Many authors consider the problems and suggest ways to develop the agricultural market. For example, Moldashev and Nikitina (2016) believe that if we consider the degree of participation of the agro-industrial sector of Kazakhstan's economy in the formation of an integrated system as a whole, so its level is insufficient. Khapova (2016) highlights the following problems of the agricultural sector in Kazakhstan: low level of technical and technological equipment of the agro-industrial complex, low level of industrial processing and underloading of processing enterprises, worn-out and obsolete equipment that cannot produce competitive products, underdevelopment of budget funds intended to support agricultural producers, slow innovative processes in agriculture.

Narenova and Bajtilenova (2016) consider that the problems of the agrarian sector in Kazakhstan are caused by the weak material and technical equipment of the production of new equipment and technologies, a high degree of depreciation of fixed assets, poor quality of products, unattractive packaging and weak assortment policy, high-pitched prices, a lack of managerial and marketing skills, unreasoned privatization, lack of effective mechanisms to regulate the tariffs of natural monopolies, weak protection of the domestic market of food products.

According to Chernobay (2015), the management of the transformations in the agrarian sector at the current stage of market agrarian relations should provide for the improvement of the mechanism for motivating production and labor activities at enterprises of the agro-industrial complex and improving the quality of use of the productive potential of a competitive enterprise. From the point of view of Sergienko, Korshikov and Chernobay (2017) for the development of the agricultural sector, it is necessary to resolve issues related to assistance to agrarians from federal agencies; to increase the role of insurance and leasing organizations in stimulating agrarians in updating the fleet of agricultural machinery; to assist the regional authorities in promoting the import substitution program. From the point of view, Burkovsky and Surkov (2017) it is necessary to attract significant investment resources to the agricultural sector for accelerated modernization. Steps in this direction should be visible, first of all, at the regional level.

However, in the literature there are no actual studies of problems of development of the agricultural sector of Kazakhstan, which will be disclosed in the framework of present article.

## **1. Literature Review**

The agrarian sector of the economy is a set of interconnected branches of agriculture and functionally connected servicing units that satisfy the need for food and raw materials for the processing industry. That is, it is agriculture (its main components are crop production and animal husbandry, their sub-sectors) and processing industry (first of all, the primary processing of such products as part of the food industry). In general, the term "agrarian sector of

the economy" by most scientists are considered to be broader in comparison with such a common term as the agro-industrial complex, although, taking into account the structure of the term "agrarian-industrial complex", arises the association "agrarian sector of the economy and the industrial sector," which inclines to recognition of the concept of "agro-industrial complex" as broader than "agrarian sector of the economy." However, the concept of "industrial" can also be seen as the allocation of a certain segment in the structure of the agricultural sector of the economy, along with other segments (for example, agrarian education and science).

At the present stage of development of the agricultural sector of the economy, it is necessary to analyze its structure in order to clearly understand the problems, bottlenecks in the organization of management, and overcome them (Usmanova and Obradovic 2015, Fomina and Redchikova 2015). At the same time, it is necessary to rely not only on theoretical knowledge, but also on the accumulated experience in the formation and development of such a structure, the use of which makes it possible to assess and realize all the positive and negative consequences of these or those structural transformations carried out in different historical periods (Francisco and Molchan 2016).

The agrarian sector consists of agricultural commercial organizations of a corporate type (in Kazakhstan it is primarily joint-stock companies and limited partnerships, although there may be the existence of agricultural cooperatives), state-owned enterprises, as well as private peasant (farm) households and households of population (personal subsidiary farms, vegetable gardens, country plots, etc.) (Tuz 2016). Can be attributed to the system of the agricultural sector and institution and organization of agrarian education, scientific, scientific-research institutions that contribute to the development of this field.

In a broad sense, the agrarian sector of the economy covers all enterprises regardless of the form of ownership and organizational and legal form, producing agricultural products and products of its primary processing, and related service enterprises, as well as organizations engaged in the development and implementation of state agrarian policy.

In the narrow sense, it is considered only as a sector of the economy, covering all enterprises that produce agricultural products that carry out its primary processing and serve these processes. The very existence of the term "agro-industrial complex" (AIC) suggests that the boundary between the agrarian and industrial (manufactured) sectors is rather conditional. In general, it can be noted that the agro-industrial complex is part of the country's economy, which includes industries for the production of agricultural products and its processing and delivery to the consumer, as well as providing the agriculture and processing industry with means of productions. Exactly this definition, with which one can agree, is given by Kim and Abdishova (2017).

The agro-industrial complex is a single integrated production and economic system that covers a number of industries. The structure of the modern agro-industrial complex includes such components: first, the agriculture itself, and secondly, the system of providing agriculture with various equipment and means of production: feed mills, microbiological industries, agricultural machinery, the production of mineral fertilizers and chemicals, and rural construction; thirdly, the harvesting, storage and processing of agricultural products (food, meat and dairy, flour-grinding), and auxiliary industries such as transportation, storage and sale of agricultural products, trade and public catering. These components are united in various kinds of agro-industrial associations, agro-enterprises, agro-firms, associations, production and scientific-production systems and the like.

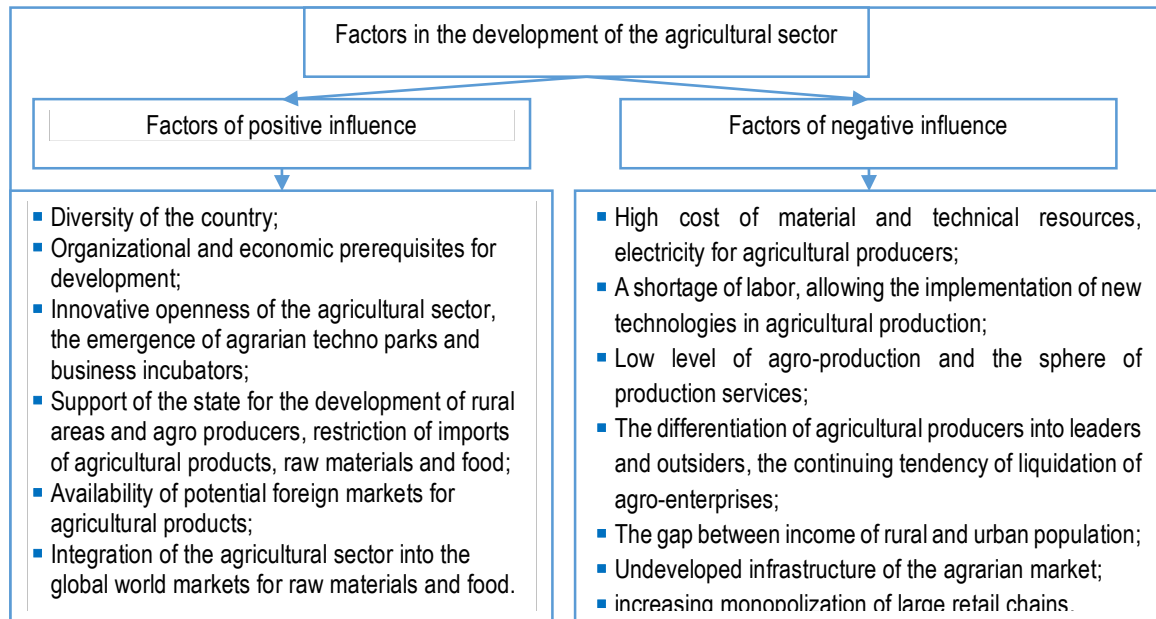
The historical trend in the development of the agrarian sector of the economy is that around the nucleus of livestock and agriculture, the food and processing industry, agricultural machinery, agricultural education and science have begun to develop. At the same time, if employment in agriculture and livestock farming decreased with each step of scientific and technical progress, in other substructures of the agro-industrial complex it increased on the contrary.

Another concept that needs to be compared with the concept of "agrarian sector of the economy" is the concept of "agriculture." Despite the fact that "agrarian" in Latin means literally "agricultural land" and formally these concepts can be considered synonymous, and quite often these words are used as synonyms, but, to date, their significance in scientific terminology has evolved so as that The "agrarian sector of the economy" is a broader concept than "agriculture." At the same time, agricultural production can be called a production system in agriculture, the state of which is characterized by a set of parameters (availability of resources, output, efficiency indicators, etc.). (Smagin 2017)

The state's influence on the development of the agrarian sector of the economy is usually understood in such terms as "state agrarian policy", "state management of the agrarian sector of the economy", "state regulation of the agrarian sector of the economy". The semantics of these concepts is not unambiguous, which encourages us to dwell on the analysis of the definitions mentioned above.



Figure 1. Factors in the development of the agricultural sector



Source: Compiled by the authors on the material of Krasilnikova and Pytkina (2014).

The problem of defining the concept of "agrarian policy" is raised in many scientific publications. The reviewing of publications, making by us, shows that in modern social science and public administration under the agrarian policy of the state usually understood as a set of organizational activities of the government in the following areas. Firstly, it is the sphere of land use and reform of property relations in the countryside, which were implemented by a certain state in a certain period. Secondly, agrarian policy refers to the regulation of the state food market by the types of products that are produced in agriculture in the territory of the state, and those that are imported from outside and affect the food security of the country's population as a whole and the position of the agricultural producer in particular. Thirdly, it is the training of personnel for the agricultural sector of the economy and the development of agricultural education and science. Fourth, this is the support of agrarian science. Fifthly, this regulation of the relations of the agricultural sector with industrial, information, etc.

Factors for the development of the agricultural sector are presented in Figure 1. Along with the notion of "agrarian policy," scientific concepts actively use the concepts "management of the agrarian sector of the economy" and "state management of the agrarian sector". We can say that the management of the agrarian sector of the economy is the broadest concept that decomposes into two components:

- 1) private management of the agrarian sector of the economy (corporate, collective individual);
- 2) public management of the agrarian sector of the economy (political management of the agrarian sector of the economy, state management of the agrarian sector of the economy, agrarian policy of local government bodies, agrarian policy of public self-government bodies).

In the broadest sense, "public administration of the agrarian sector of the economy", "public management of the agrarian sector of the economy" and "state agrarian policy" may coincide. State regulation of the agrarian sector of the economy can be considered as part of the state management of the agrarian sector of the economy, which should be manifested primarily through indirect economic levers of influence through regulatory support for economic processes in the agricultural sector of the economy. State regulation is an indirect influence of the state on socio-economic processes through laws and regulations, support for specific price, credit and tax mechanisms, a mechanism for quoting exports and imports, and stimulating the initiative of the management objects themselves. From this point of view, it follows that " by managing, the state regulates, and, by regulating – it governs".

Prerequisites for the formation and development of the system of state regulation of the agrarian sector of the economy in modern conditions are: the need to create and develop a system for protecting agricultural commodity producers, insurance their activities; the instability of prices and incomes in agro-industrial production; weak attractiveness of investment in agriculture; the need to ecologization the agricultural production (Zakharova 2016).

Functions of regulation of the agricultural market by the overwhelming majority of the countries of the world are entrusted to a specialized body, whose activity is primarily aimed at ensuring a price balance for the main types



of agricultural products. To achieve it, the authorized body uses a number of tools, the key among them is the introduction of special prices depending on the volume of products produced by agricultural enterprises and the situation in the world agrarian market. Various types of support for low-income consumers are also widely used.

A feature of the general agrarian policy of the European Union is the establishment of target prices for types of agricultural products. In order to regulate the prices of agricultural products, separate specialized bodies function in certain EU countries. In Poland, for example, in order to stabilize the market and protect the incomes of farmers, the state conducts interim purchases of seasonal surpluses of agricultural products and food and the sale of these products during the deficit period. This function is performed by the State Agrarian Market Agency, which operates in the markets of grain, dairy products, meat, sugar, hops and potato processing products. The agency also establishes export subsidies for the export of products.

In the Czech Republic, there is a State Agricultural Intervention Fund, whose activities are aimed at: interventional purchases of certain types of products at an interventional price; financing, storage and, if necessary, processing of products purchased at an intervention price; realization of the accumulated stocks of production in the internal and external markets; the provision of subventions to support exports, the introduction of an industrial quota system.

Regulation of prices, including agricultural products, in Japan is carried out by the Bureau of Prices of the Office of Economic Planning. Its functions include: studying market conditions and changes, analyzing the dynamics of prices for a certain period, developing measures to support demand and prices at a relatively stable level, monitoring compliance with antimonopoly legislation. In the United States, the duties of price regulation in the agrarian sphere are vested in the Ministry of Agriculture. Within the framework of federal agricultural programs, farmers engaged in growing cereals receive loans from the Ministry of Agriculture for financing production.

Effective development of rural territories in more than 130 countries depends on information-consulting services from the side of farm advisory services. Advisory services in the United States operate on the basis of universities, funding is provided from the following sources: 25% by the US Department of Agriculture, 40% by the State Government, and 35% by the District Government. Groups of experts at the federal level develop strategic plans for priority programs of activities that cover agricultural production and the environment, social, youth programs, etc. (Sobkevich *et al.* 2014).

In Denmark, consultative information-consultation centers are located in suburban areas near farms. Around the building of the center there are demonstration sites, where specialists of the center conduct research and introduce farmers to the achievements of science, explain in practice how to apply protective equipment, fertilizers, agricultural tools. Information and consulting centers are equipped with modern computer equipment and conduct classes in special training classes. Particular attention is given to the development of programs and business projects, financial statements of households (accounting and tax reports, for example, because the vast majority of farmers do not have special knowledge and relevant experience), as well as showing films with new technologies. Such centers on a regular basis serve up to 70 farms. The specialists of the center monthly provide households with information materials, go to the inspector's check in order to understand the problems of the farms on the spot and make sure that the recommendations are implemented correctly.

The Advisory Service of Canada is part of the Department of Regional Agricultural Services of the Ministry of Agriculture and Food and unites 4 regional and 39 district offices, which employ advisory experts, specialists in agrarian economy, agricultural production (zootechny, agronomy), agribusiness (management), engineers, and administrative staff. At the district level, consultants provide services to producers and their families, increasing the knowledge and skills of agricultural management and marketing about new production technologies. In addition, the staff of the advisory service provides advice to families of farmers on improving business conditions, planning economic activities, organizing and supporting clubs, promoting the development of leadership in rural communities. The duties of specialists in agrarian production, who work in four main regional advisory offices, in addition to providing advice to farmers, also include assistance to specialists from district offices. An effective and structured system is a consultancy system in Poland, which is established and operates with the support of the state. Financing the agricultural consultancy system from the budget provides free information to farmers and villagers, which is an important tool for helping agricultural producers.

In the European Union, the importance of the agricultural advisory system has been reflected in the legal acts of the member countries of this organization, as well as in the legal acts of the European Union. Thus, Council Regulation No. 73/2009 on the establishment of common rules for direct farmer support schemes under the Joint Agricultural Policy and on the establishment of some support schemes for farmers contains a rule that EU Member States should have a system for advising farmers on land issues and on farm management, managed by one or

more designated bodies or private organizations. And the system of consulting farmers must meet the national requirements for agricultural management of the country.

The level of support of agricultural producers in Kazakhstan consists of such factors as influence on domestic and foreign prices due to intervention in the local market and regulation of import tariffs. Direct support of producers of agricultural products is widely used through subsidies for the purchase of seeds, chemicals, rates of remuneration, provision of public services in veterinary medicine, phytosanitary, science and education, etc. Together, various schemes and mechanisms provide state support for more than 1% of GDP.

Agrarian reforms in Kazakhstan have always had an unstable character – starting in 1991, they suddenly stopped in 1992-1993, then revived in 1994-1995, and in 1996, until 2000, they again stalled. Almost the entire first five-year period of Independence of Kazakhstan carried out land reform with the introduction of the right of private ownership of land, as the main instrument of production in agriculture. Finally, the current legislation took shape on December 22, 1995 in the "Law on Land".

The second five-year period saw the formation of a new legal field for the agro-industrial complex post of the privatization period. The Land Code was adopted in 2005, the Law "On State Regulation of the Agro-Industrial Complex and Rural Territories" was adopted. From 1994 to 2001, the main institutions for the implementation of agrarian policy in Kazakhstan were also formed: in 1995, the Food Contract Corporation JSC for government grain interventions; in 1994, JSC "Fund for Financial Support of Agriculture" for short-term financing of field works and covering losses in crop production; in 1999, JSC "KazAgroFinance" to provide equipment and machinery for leasing to agribusiness entities; in 2001, JSC "Agrarian Credit Corporation" for direct loan financing of agribusiness entities; in 2006 all these institutes were merged into JSC "National managing holding" KazAgro". After 2010, since the creation of the Customs Union, Kazakhstan has faced the problem of fair liberalization of markets and resumed negotiations on accession to the WTO. From the question of local sectoral significance, the agro sector got up in a row of strategic state tasks on the world market.

Thus, during the period from 1992 to 2017, Kazakhstan's agrarian policy underwent a number of fundamental changes. Several state programs were developed: the Agricultural Development Program for 2000-2002; The State Program for the Development of Rural Areas for 2004-2010; The State Agricultural and Food Program for 2003-2005; Agricultural Development Program for 2010-2014; Program for the development of the agro-industrial complex in the Republic of Kazakhstan for 2013-2020 "Agrobusiness 2020", approved by Decree of the Government of the Republic of Kazakhstan dated February 18, 2013 No. 151 with separate sectoral master plans; The State Program for the Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2017-2021 (Eximar Foresight 2018).

In order to improve the state support of the agro-industrial complex, the development of priority directions for agriculture and improvement of state support for the agro-industrial complex have been developed. The maps are developed on the basis of a detailed analysis of existing problems and contain specific measures in the following areas of development: agricultural cooperation; intensive technical re-equipment of the agro-industrial complex; seed production; increasing the effectiveness of phytosanitary measures; agrochemistry; fodder production (fodder balance); involving arable land in circulation; transhumance sheep breeding; wholesale distribution centers; cardinal modernization of agrarian science; agro-processing; improvement of state support measures. At present, Maps are thoroughly discussed with representatives of industry associations and unions, public councils, agribusiness and scientific organizations at the Ministry's platforms, NCE «Atameken», and in the regions.

The implementation of the Maps will allow the agro-industrial complex to be raised to a qualitatively new level of development, to increase its competitiveness, to strengthen the stability of the domestic food market and to strengthen the export orientation of the industry (Barbosa *et al.* 2015; MSA RK site 2018). The solution of the problems of the development of the agricultural sector is largely related to the level of financing, mainly from the state budget, which should be based on the principles of strategic planning, focusing on significant and priority areas for improving the competitiveness of agriculture and ensuring food security.

## 2. Materials and Methods

The main method that can be used to analyze the development of the agricultural sector in Kazakhstan is statistical analysis. In Kazakhstan, the Committee on Statistics of the Republic of Kazakhstan is a service that is responsible for the collection and publication of statistical data in open sources, including by region. To analyze the indicators characterizing the development of the agricultural sector, the author selected:

- Number of registered legal entities in agriculture, forestry and fisheries in Kazakhstan;
- Dynamics of registered and active producers of agricultural products;
- Gross output of agricultural products (services);

- Gross harvest of main crops;
- Number of cattle and poultry;
- Productivity of main crops, centners from one hectare, *etc.*

At the same time, these indicators should be investigated in dynamics over several years. By way of an empirical research base, has chosen the data on the agricultural sector of Kazakhstan. It is important to characterize the agricultural sector of Kazakhstan. The area of the territory of Kazakhstan exceeds 2.7 million square kilometers and is on the 9th place in the world in size, which has to the development of agriculture. In international comparison, Kazakhstan has huge agricultural land resources, where 80% of the territory is suitable for certain types of agrarian activities. It should be noted that most of the territory of Kazakhstan is in the zone of risky farming, there is soil degradation and erosion. Over 80% of agricultural land falls on pastures, about 12% are occupied by arable land, the rest is represented by hayfields and other lands. In the area of arable land per capita, Kazakhstan is located between large countries with developed agriculture Australia and Canada with an indicator of 1.7 hectares per person. A large area with different climatic and soil characteristics determines the specialization of the regions. So, the northern regions traditionally develop grain production, where agriculture forms from 15% to 25% of the gross regional product. Regions of the south are engaged in the cultivation of rice, fruits and vegetables, the share of agriculture reaches 15%.

The remaining regions are mainly engaged in livestock farming with a share of agriculture less than 10%. Almost half of agricultural production in Kazakhstan is produced by households, about 30% by peasant and farmer households and slightly more than 20% by agricultural enterprises. Production output in plant growing is 39% formed by peasant and farmer economies, 31% are provided by agricultural enterprises and 30% by the economy of the population. Approximately 61% of the total area of crops falls on agricultural enterprises, 38% on peasant farms and 1% represent households. The output of livestock products by 71% depends on the households of the population, 15% is given by peasant and farming enterprises and 13% by agricultural enterprises. Agricultural enterprises in recent years specialize in the production of pork, cattle, poultry and eggs. The farms of the population are engaged in the production of meat of most types of livestock and milk. Peasant and private farms are moderately employed in the production of meat. Livestock breeding on an industrial basis is not so widespread, the share of pedigree livestock of meat and dairy direction is only 2%-3% in the total number of livestock. The main export of agrarian products is grain, the export of which brings more than \$ 1 billion a year, together with the export of flour, the share of these products exceeds 60% of total exports (Kurmanbeko and Temirkhanov 2018).

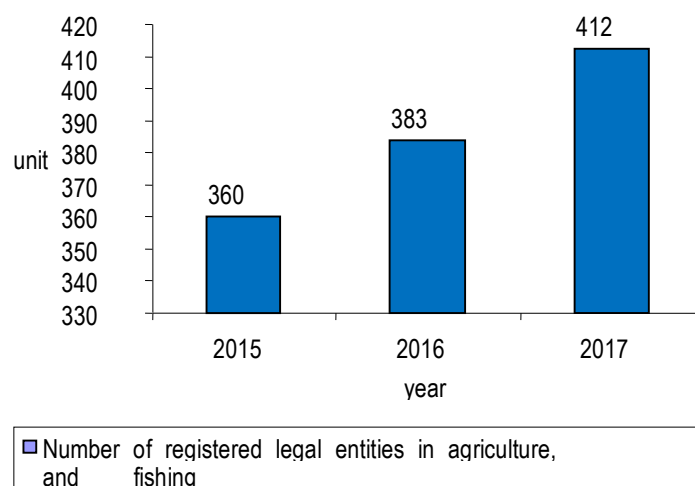
The study of the problem was carried out in three stages:

- 1) at the first stage, a theoretical analysis of the existing methodological approaches to the analysis of the development of the agricultural sector in Kazakhstan, selected statistical indicators for analysis;
- 2) at the second stage, the selected indicators were studied, their comparison in dynamics (2015-2017) and with the countries of the EAEC;
- 3) at the third stage, general conclusions were drawn regarding the development of the agricultural sector in Kazakhstan, and proposals were made to improve the management of the agricultural sector in Kazakhstan with a view to its development.

### 3. Results

The dynamics of the number of registered legal entities in rural, forestry and fisheries in Kazakhstan is presented in Figure 2.

Figure 2. Dynamics of the number of registered legal entities in agriculture, forestry and fisheries in Kazakhstan for 2015-2017, units



Source: Compiled by the authors on the basis of the Committee on Statistics of the Republic of Kazakhstan

Number of registered legal entities in agriculture, forestry and fisheries in Kazakhstan for 2015-2017 annually increased and amounted to 412677 units at the end of 2017. Dynamics of registered and active agricultural producers in Kazakhstan is presented in Table 1.

Table 1. Analysis of the dynamics of registered and active agricultural producers in Kazakhstan

Index	2015 y., unit	2016 y., unit	2017 y., unit	Growth rate 2016 y. to 2015 y., %	Growth rate 2017 y. to 2016 y., %
<b>Registered producers of agricultural products</b>					
Peasant or private farms	184.608	185.754	194.828	100.6	104.9
Households of settlements, villages, rural districts	1.608.754	1.643.349	1.645.739	102.2	100.1
Legal entities, branches and representative offices	13.186	14.842	15.770	112.6	106.3
<b>Current producers of agricultural products</b>					
Peasant or private farms	177.576	177.884	187.900	100.2	105.6
Legal entities, branches and representative offices	8.089	9.740	12.217	120.4	125.4

Source: compiled by the author on the basis of the Committee on Statistics of the Republic of Kazakhstan

For 2015-2017 years annually the number of registered and active agricultural producers in Kazakhstan grew. The gross output of agricultural products (services) is presented in Table 2.

Table 2. Gross output of agricultural products (services) in Kazakhstan

Index	2015 y., mln. KZT	2016 y., mln. KZT	2017 y., mln. KZT	Growth rate 2016 y. to 2015 y., %	Growth rate 2017 y. to 2016 y., %
Gross output of agricultural products (services), of which:	3,307,009.6	3,684,393.2	4,097,455.3	111.4	111.2
Gross crop production	1,825,236.7	2,047,580.8	2,278,340.90	112.2	111.3
Gross livestock production	1,469,923.0	1,621,541.4	1,807,142.50	110.3	111.4

Source: Compiled by the authors on the basis of the Committee on Statistics of the Republic of Kazakhstan

These tables show an annual increase in the output of agricultural products (services, both crop and livestock): 11.4% in 2016 and 11.2% in 2017. The gross harvest of the main crops is presented in Table 3.

Table 3. Gross harvest of main crops in Kazakhstan

Index	2015 y., ths. tons	2016 y., ths. tons	2017 y., ths. tons	Growth rate 2016 y. to 2015 y., %	Growth rate 2017 y. to 2016 y., %
Cereals (including rice) and legumes	18,672.8	20,634.4	20,585.1	110.5	99.8
Sunflower seeds	534.0	754.9	902.6	141.4	119.6
Cotton	273.9	286.7	330.5	104.7	115.3
Sugar beet	174.1	345.0	463.2	198.2	134.3
Tobacco	1.4	1.0	1.1	71.4	114.3
Potatoes	3,521.0	3,545.7	3,551.1	100.7	100.2
Vegetables	3,564.9	3,795.2	3,791.1	106.5	99.9

Source: Compiled by the authors on the basis of the Committee on Statistics of the Republic of Kazakhstan

In 2016, there was a decrease in tobacco harvest, and in 2017 a decrease in the collection of cereals and legumes, as well as vegetables. For other types of basic crops, the gross harvest was increasing. The largest volume of grain in 2017 in Kazakhstan was brought by the North-Kazakhstan region, agrarians of which threshed 5 million 627.5 thousand tons. Next is the Kostanay region with a result of 5 million 225.3 thousand tons. The Akmola region closes the top three – 5 million 123.9 thousand tons.

Let us compare the growth for 2017 of production by countries and main agricultural crops of Kazakhstan and the countries of the EAEC in Table 4.

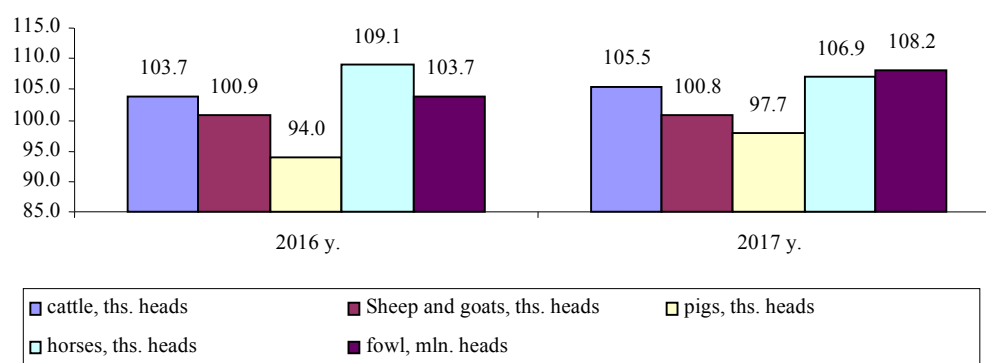
Table 4. Growth rate of production by countries and major agricultural crops in 2017 relative to 2016.

Countries	Cereals (including rice) and legumes	Sugar beet	Potatoes	Vegetables	Sunflower seeds
Armenia	-50	n.a.	-10	-11	-25
Belarus	7	15	7	3	230
Kazakhstan	-0.2	34.3	2.0	1.5	19.6
Kyrgyzstan	-2	1	2	2	-4
Russia	12	1	-5	1	1

Source: Compiled by the authors on the basis of the International Independent Institute of Agrarian Policy

For the production of cereals (including rice) and legumes, the leaders in terms of growth in 2017 are Russia and Belarus, on sugar beet Kazakhstan, on potato and vegetables Belarus, on sunflower seeds Belarus and Kazakhstan. In comparison with the EAEC countries, Kazakhstan has a high growth rate for agricultural production in 2017. The dynamics of the number of livestock and poultry will be considered in Figure 3.

Figure 3. Dynamics of livestock and poultry in Kazakhstan in 2015-2017, %



Source: compiled by the authors on the basis of the Committee on Statistics of the Republic of Kazakhstan

In 2016-2017 years there was a decrease in the number of pigs, an increase in the number of cattle, birds, sheep, goats, horses. The Yield indicators are present in Table 5.

Table 5. Yield of the main agricultural crops in Kazakhstan

Index	2015 y., centners per hectare	2016 y., centners per hectare	2017 y., centners per hectare	Growth rate 2016 y. to 2015 y., %	Growth rate 2017 y. to 2016 y., %
Cereals (including rice) and legumes	12.7	13.5	13.4	106.1	99.4
Sunflower seeds	7.6	9.3	10.2	123.0	109.1
Cotton	27.8	26.2	24.4	94.1	93.3
Sugar beet	232.5	285.5	274.4	122.8	96.1
Tobacco	30.4	28.3	34.4	93.0	121.6
Potatoes	185.5	190.4	194.2	102.6	102.0
Open ground vegetables	245.8	250.0	253.7	101.7	101.5

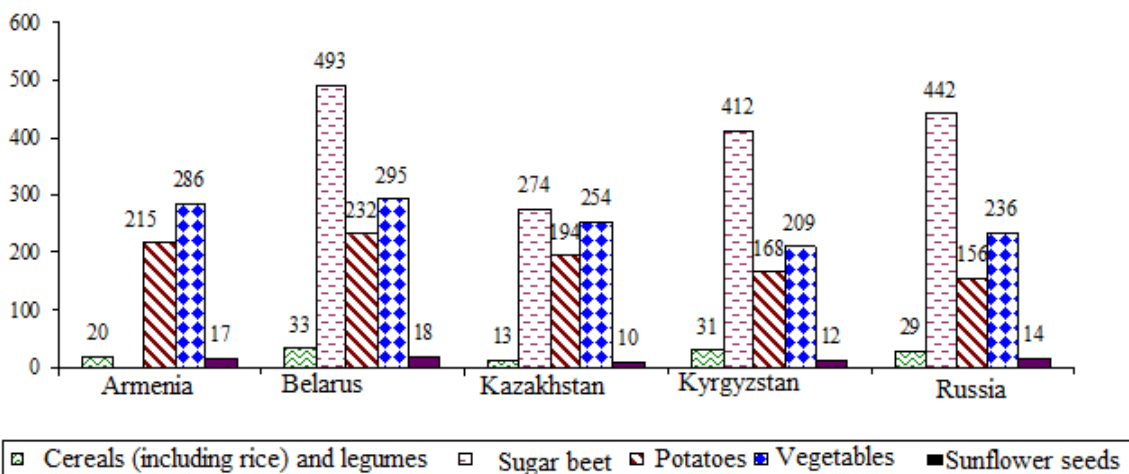
Source: Compiled by the authors on the basis of the Committee on Statistics of the Republic of Kazakhstan

The highest yield in Kazakhstan is beet and vegetables. In 2016 the yield of cotton and tobacco declined, in 2017 yields of cereals, cotton, beets declined. Let's compare the productivity of Kazakhstan and the countries of the EAEC in Figure 4.

The leader of the EAEC for the production of crop production is Russia. The share of Russia in the total volume of production exceeds 80%. At the same time, Belarus and Armenia occupy leading positions in the yield of the main agricultural crops. Kazakhstan has rather low yields for all agricultural crops. The increase in crop yield remains one of the most promising areas for increasing crop production in Kazakhstan.

The effectiveness of Kazakhstan's agrarian sector in comparison with developed countries is very low. The volume of production per 1 hectare of farmland is 108 US dollars, for example, in Germany – 1961 US dollars, in Japan – 1720 US dollars. As a result, Kazakhstani farmers earn on average 16 times less than in the countries mentioned (Tleuzhanova *et al.* 2016).

Figure 4. Yields of the main agricultural crops in the EAEC countries, centners per hectare



Source: Compiled by the authors on the basis of the International Independent Institute of Agrarian Policy

#### 4. Discussion

Based on the analysis of the development of the agricultural sector in Kazakhstan, the following trends were identified:

1. The number of registered legal entities in agriculture, forestry and fisheries is growing.
2. The number of registered and active producers of agricultural products in Kazakhstan is increasing.
3. Growing gross output of agricultural products (services) in Kazakhstan.
4. The gross harvest of the main agricultural crops in Kazakhstan is increasing.
5. There is a decrease in the number of pigs, an increase in the number of cattle, birds, sheep, goats, horses.
6. The yields of cereals, cotton, beets are decreasing.
7. In comparison with other EAEC countries, Kazakhstan has low yields for all crops.
8. Kazakhstani farmers earn on average 16 times less than developed countries.

The ways of solving the problems of the development of the agricultural market by different authors are seen in different ways.



So, Sigarev and Nurkuzhaev (2017) offer to increase production of agricultural products to unite the economy of the population with large farms, apply innovative technologies. Saginova (2017) believes that it is necessary to develop directions for the development of nanotechnology, their phased implementation and increase the cost of scientific research. The use of nanotechnology in agriculture for the cultivation of grain, vegetables, plants and animals, in the production of products, in processing and packaging, will lead to the birth of a completely new class of food competitive products – "nanoproducts" that will eventually out genetically modify products from the market. Within the framework of integration, joint programs can be implemented to create innovative technologies, market infrastructure, and periodically monitor the state of food security in the country (Saginova 2017). In the opinion of Karimov, Savchenko and Ismukanov (2017), the state needs to develop projects in each segment of the agricultural complex on the basis of public-private partnership. The agrarian policy of Kazakhstan should be aimed at a radical increase in labor productivity and growth in exports of processed agricultural products.

During the entire development of the country's agro-industrial complex, Kazakhstani farms and agro-enterprises have learned to grow various crops and produce grain. But this is not enough. It is necessary to ensure the processing of raw materials and enter the world markets with high-quality finished products. It is important to radically reorient the entire agro-industrial complex to this task. Priority attention requires the development of agricultural science. It should deal primarily with the transfer of new technologies and their adaptation to local conditions.

It is necessary to revise the role of agrarian universities. They should not just issue diplomas, but prepare specialists who will really work in the agro-industrial complex or engage in scientific activities. These universities are required to update training programs and become centers for the dissemination of the most advanced knowledge and best practices in the agro-industrial complex. For example, a multiple increase in productivity can be achieved through technologies for predicting the optimum time for sowing and harvesting, "smart irrigation," intelligent mineral fertilization systems, and pest and weed control. It is necessary to provide all-round support to agricultural cooperatives, therefore the state together with business should find strategic niches in the international markets, promoting domestic, Kazakhstan, products.

Intensification of agriculture should take place with preservation of quality and ecological compatibility of products. This will create and promote a brand of natural food "Made in Kazakhstan", which should become recognizable in the world. In addition, it is necessary to stimulate those who use the land with the best return, and take measures to inefficient users. It is necessary to reorient ineffective subsidies to reduce the cost of bank loans for agribusiness entities (Mishchenko *et al.* 2016).

Thus, so far, at the present stage, the effectiveness of the agricultural sector in Kazakhstan is low – at present, compared with developed countries, Kazakhstani farmers earn on average 16 times less. The gross yield and yield of individual crops are declining. The author's position is that the agrarian sector needs a gradual transition to new technologies, state support of the domestic producer, and the creation of environmentally friendly and competitive agricultural products.

## Conclusions

Summarizing the results, we can draw the following conclusions. If we consider the concept of the "agrarian sector" in a broad sense, it can include the main sub-sectors of agriculture, together with the processing industry that provides processing of agricultural products, as well as with institutions of agricultural education and science, central and local governments of the agrarian sector of the economy. In the narrow sense, it is considered only as a sector of the economy, where agricultural products are produced and its primary processing is carried out. At the same time, the agrarian sector is one of the important sectors of the economy that participates in ensuring national security through the formation of the country's food security.

Today, the agrarian sector of Kazakhstan has prospects for further development: there are sales markets, arable land, the prospect of developing irrigated lands, the export positions of the oilseed and meat sectors are increasing, and Kazakhstan is one of the largest exporting countries in the world for grain and flour. Analysis of the development of the agricultural sector has revealed a number of problems: the low efficiency of the agricultural sector, the reduction of gross harvest and the yield of individual crops.

Taking into account the identified problems, it is necessary to develop agrarian science for the development of the agrarian sector of Kazakhstan, provide all-round support to agricultural cooperatives, the state together with business to find strategic niches in international markets, create and promote a brand of natural food "Made in Kazakhstan", to stimulate those who use land with the best return, to create conditions for cheapening bank loans to the subjects of the agricultural sector.

At the same time, there is a need to further study the features and trends in the development of the agricultural sector, to identify opportunities to strengthen Kazakhstan's position in the global agricultural market. The most promising direction of further research in the development of the agricultural sector is the study of the experience of leading countries of agricultural producers, which will provide an opportunity to find out which tools are the key to the development of the agricultural sector in Kazakhstan.

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## Economic Problems of the Development of Agro-Industrial Complex: Mechanism of Solution

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### Abstract:

This article notes that in the present role of the state is to determine the overall strategy for the development of the industry, create the conditions for the most favorable conditions, addressing the overall infrastructure problems, the solution of which will determine the successful development of agriculture in the republic. A number of serious reasons for the need to regulate agricultural production are highlighted.

The target indicators of the development of the agro-industrial complex up to 2020 are given, an analysis of the structure of gross value added, the reasons for the rise in prices for agricultural products are shown. It is noted that one of the main sources of financing investments should be depreciation. A direct correlation is shown between the size of allocated subsidies and the financial results of enterprises in the agricultural sector. The proposals to increase funding for agricultural production are given.

**Keywords** gross value added; agricultural production; republican budget; economy; profitability; subsidies

**JEL Classification:** M21; M29

### Introduction

The market economy implies a change in the role of the state in terms of reducing the degree of its intervention in the economic activity of the subjects of the agrarian market. The effectiveness of the functioning of the state apparatus is precisely determined by the ability to foresee and predict, calculate and plan, formulate and create organizational and economic prerequisites for the implementation of its policies, including the agrarian

The Message of the President of the Republic of Kazakhstan N. Nazarbayev to the people of Kazakhstan dated October 5, 2018 "Growth of the welfare of Kazakhstan: increase of incomes and quality of life" reflects the

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need to fully realize the potential of the agro-industrial complex. The main task is to increase labor productivity and export of processed agricultural products by 2.5 times. All measures of state support should be directed to the large-scale attraction of modern agricultural technologies in the country (Nazarbayev 2018).

## 1. Research Background

Valuable practical assistance in studying the features of the functioning of the economic mechanism of regulating the agricultural sector and its improvement was given by studying the works of leading Russian scientists Grigoruk (2017), Kaliev (2018), Satybaldin (2017), Yertazin (2017) and others.

In agricultural production there are a number of features that do not allow relying on the spontaneous action of the market. The following "shortcomings" in the activities of the agrarian market are highlighted. First, due to the growth of labor productivity and with the saturation of the market, the growth of agricultural production leads to a sharp fall in prices, as the demand for food products changes little. Secondly, the negative elasticity of food prices, depending on the supply is high, that is, prices during overproduction fall sharply, which can cause massive ruin of producers. Thirdly, the low elasticity of demand for food, depending on the income of consumers, has little effect on the increase in demand, as well as a decrease in prices, causing a relatively small increase in the demand for food. Finally, fourthly, the relatively high dependence of agricultural production on natural and climatic factors forces the state to help stabilize prices for it, because otherwise high risk and non-optimal decisions of producers are inevitable when planning their production in subsequent periods of the organization (Gray 2011).

Along with these reasons, it is also commonly called the need to protect domestic agricultural production from the penetration of products from those countries where production costs are significantly lower. Or vice versa, support for exporting own products to the external market.

## 2. Methodology

In accordance with Strategy 2020, the AIC plays a special role in the development of the economy. In this regard, the Target Indicators of the State Program for the Development of the AIC in the implementation of the strategic goals provided by Strategy 2020 (Table 1).

Table 1. Target indicators of the development of the State program of development of the agro-industrial complex of the Republic of Kazakhstan

Indicator	2017	2018	2019	2020	2021
The index of the physical volume of labor productivity in agriculture, in% to the level of 2015	112,0	118,0	124,0	132,0	138,0
Volume index of gross output (services) of agriculture, in% to the level of 2015	108,0	113,0	118,0	125,0	130,0
Growth in food exports, in millions of dollars	920.0	1,077.0	1,168.0	1,329.0	1,481.0
Reduction in food imports, in millions of US dollars	2,466.0	2,377.0	2,288.0	2,196.0	2,105.0

Source: compiled and calculated by authors

According to the Accounts Committee to monitor the execution of the republican budget, the achievement of the goal of the Strategy 2020 on labor productivity has been completely decomposed into the level of the State Program for the Development of the AIC, which implies ensuring its implementation by achieving the target indicator of the State Program.

At the same time, according to the State Program for the Development of the Agro-Industrial Complex, labor productivity in the agro-industrial sector should be 219.4% (compared to 2009), which is almost 180.5% less than the stipulated value in Strategy 2020.

There are a number of serious reasons for the need to regulate agricultural production. So, these are reasons of a political nature, due to the domestic political and foreign policy significance of the agrarian sector itself. The state is responsible for the food supply of the population. Serious violations can reveal social conflicts, and even the collapse of the political system. That is, with legal, administrative and economic (financial) levers, the state acts on the agricultural sector in order to achieve political goals. The state regulation itself is the system of measures of state influence on the agricultural sector.

Another group of causes is associated with the influence of natural and climatic factors. Their action dictates the need for the creation and development of state-regulated insurance. An important factor in determining the need for government intervention in the regulation of agricultural production is that the agricultural sector is in dire need of supporting and protecting its interests from highly monopolized industries. If we add to this the need of the



agricultural sector in the development of social and production infrastructure, as well as the need to greener agricultural production, the need for state support for the agricultural sector becomes even more obvious.

Of the industry characteristics, first of all, it should be noted that the main means of production of the industry is land. In addition to physical, chemical and biological features caused by nature, it is characterized by a lack of fertile land, a difference in territorial location, a variety of climatic conditions, and the efficiency of agricultural production, as is well known, largely depends on these factors. However, significant financial costs are required to maintain the level of land fertility and its improvement. It should be noted that in developed countries, the financial costs of their preservation and increase are allocated from the state budget. Land sites and their fertility are considered here, regardless of land ownership forms, as a national treasure (Krylov 2012).

Agricultural production is directly related to living organisms, the physiological evolution of which for the most part takes place regardless of human society. Only therefore, the beginning and end of production is determined by biological factors, and working time does not correspond to the period of production. That is, the economic processes of production depend on the natural processes of the development of living organisms.

It should also be noted that the seasonality of production is very characteristic of crop production, which puts a high risk of earning income. That is, in the conditions of free competition, agricultural production, compared to other industries, is less effective and without state intervention it simply cannot do. The biological conditionality of the seasonality of agricultural production and the need to use part of the output for industrial needs has a great influence on the nature of the circulation of working capital of agricultural enterprises.

In agricultural production, along with the usual (or money) circulation, there is another, the so-called natural circulation. The interrelation of these two circuits is manifested in the fact that in production the basic and material resources are advanced in a certain ratio, which is individual in each farm, because, ultimately, it depends on the level of specialization and development of production. Violation of the noted factor causes imbalances in the development of the economy, and, accordingly, reduces its effectiveness.

No less important factor is also the fact that the farmer's work is very difficult, unregulated, and therefore there is a large outflow of population from the countryside.

Thus, the peculiarities of agriculture, namely, its seasonality, dependence on natural and climatic conditions, unattractiveness for investors, constant risk in earning income, disparity of prices between agricultural products and resources necessary for its production, a long period of time for obtaining products and many other features determine, in our opinion, the constant attention of the state and its full support.

The success of the ongoing economic reform was largely dependent on changes taking place in the agrarian sector of the economy. Among the many tasks that were to be solved in this area, not least was the problem of creating the optimal mechanism of economic relations between the subjects of agricultural production and the state.

There were both external and internal causes of the difficult state of agricultural production. External - inflation, budget deficit, a sharp rise in the cost of credit resources, non-payment, weakening of the state management of the agrarian economy, changes in the rules of economic behaviour and inconsistency of land and agrarian legislation, lower incomes of the majority of the population, which caused its low purchasing power and reduced effective demand for food. Internal - the discrepancy between the transformation of property relations and changes in the general economic conditions of the agricultural sector, including the development of market infrastructure.

The weakening of the role of the state is reflected in the sharply increasing disparity in prices for agricultural products and industry, and a reduction in the state budget. In addition, the state has not become a reliable subject of market relations, as one of the major buyers of agricultural products (bill system).

A lot of unsolved problems have accumulated in matters related to budget financing of agricultural production. The applied forms of financing agricultural production, as well as the system of payments to the budget, did not produce the desired effect. As a rule, in a market economy, enterprises should earn money to finance expanded reproduction themselves, but this requires certain conditions, and first of all, sufficient solvency of the population. However, the low standard of living of the majority of the population did not allow the implementation of this principle.

The course towards the all-round development of market relations severely limits the direct administrative intervention of state structures in the economic activities of enterprises. However, the state regulation of social production, and especially agriculture, by virtue of its specificity, in all forms of ownership of the means of production remains a vital task. Thus, the object of state regulation in the post-socialist countries, including the countries of Eastern Europe, is the financial and economic sphere of the agrarian sector. In these countries, financial and economic regulation with the help of subsidized, credit, tax and other instruments is the main, even the only means



of helping and solving problems that the agricultural sector cannot do at its own expense (Kalychev and Vlahinski 2017).

Increasing dictates were experienced by agricultural producers from enterprises that process and sell agricultural products. Agricultural enterprises and farmers, deprived of the natural share of income in agribusiness, lost a significant part of the income generated in the food complex, which was almost entirely inherited by enterprises and organizations serving agriculture. The decline in the solvency of rural producers led to a sharp decline in the fleet of agricultural machines used in the agro-industrial complex, which was particularly acute in peasant and private farms.

The Government of the Republic of Kazakhstan approved the programs for the development and support of peasant (farmer) farms of December 3, 1990, the socio-economic development of Aul for 1991-1995 and for the period until the end of 2000, as well as the Concept of regional policy of Kazakhstan of September 9, 1996, which determined the priority areas of activity of the regions. A more consistent conceptual justification of the problem of state regulation of agriculture was found in the Government Decree "On the Strategy for the Development of Agriculture in the Republic of Kazakhstan until 2010" and "On the Expanded Plan of Measures for Implementing the Strategy for Agriculture and Agriculture 2010" economic entities, business freedom, economic autonomy, free disposal produced agricultural products and derived income from its realization.

It should be noted that in agriculture in recent years there have been a number of positive trends:

First, in all regions a mixed economy was formed, a rational relationship developed between the number of peasant (farmer) farms and enterprises of a corporate type — production cooperatives, economic partnerships, and joint-stock companies.

Secondly, in the countryside, the scope of agro-service processing and marketing of products is gradually being formed, mainly working in close contact with farmers on mutually beneficial economic conditions.

Thirdly, the legislative and legal base creates favorable conditions for successful rural management. Free access to land, product sales markets, allows initiative farmers and business leaders to increase agricultural production and increase income (Satybaldin 2014).

However, the state did not take into account the fact that the subjects of the agrarian sector are not yet ready for market conditions of management, which naturally led to negative consequences. The state has taken the first steps in order to support them. Let's take as an example some of them. In response to the abolition of the state order for agricultural products in 1994, in October 1998 the Government of the Republic adopted a Resolution. "On some measures for the purchase of grain and support for agricultural producers", the state allocated \$ 100 million for the purchase of grain at a price of \$ 80 per ton of grain of the third grade of soft varieties.

The next step of the state in support of agriculture was the fact that the Government of the country provided CJSC "Small Business Development Fund" with credit resources in the amount of 98 million 248 thousand US dollars intended for the purchase of grain by CJSC Food Contract Corporation and grain companies in the domestic market. the market among the subjects of the agrarian market, including for individuals, food grains and seeds of grain crops in the amount of 1 million tons.

In general, the grain procurement program has become an example of the state fulfilling its most important function of supporting the agrarian sector through procurement intervention. It provided protection for commodity producers and assisted a specific peasant, contributed to the creation of stable state reserves for long-term storage in the republic, preventing dumping when exporting grain for export and a shortage of seeds in the republic (Yesirkepov and Ziyabekov 2016).

Disparity of prices for industrial and agricultural products, lack of working capital and a number of other reasons led to the fact that agricultural producers were not able to acquire the necessary equipment of domestic and foreign production. For this reason, the agricultural machinery factories almost ceased production of machinery. The main producers of agricultural machinery and equipment for the agricultural industries used to be Russia, Ukraine, Belarus, and only about 10% of the required range was produced in Kazakhstan. Therefore, one of the most effective means of overcoming the crisis in our republic has been leasing as a specialized form of financing investments. In Kazakhstan, a specialized financial structure was created with a 100% state-owned stake - Kazagrofinance JSC, through which the state leasing program was implemented. Kazagrofinance was fully liable to the republican budget. In order to financially improve the economic entities of the agrarian subject, the "Provision on peculiarities of applying bankruptcy procedures for agricultural organizations" was adopted, approximate recommendations were developed on the issues of deepening reforms in the agricultural sector and improving insolvent farms. The criteria for determining the three groups established in the field in accordance with the Decree of the Government of the Republic of Kazakhstan of February 25, 1998 No. 139 "On Additional Measures for the Implementation of Economic Reforms in Agriculture" were approved.

In the conditions of market relations, agriculture becomes a special sphere of the economy and implies a special state policy of regulation and support by the state, which is now being tried in our country. However, studies of economic processes have shown that there is no clearly defined strategy for the development of agro-industrial production in the republic; its results are affected by the lack of investment programs to implement agrarian reforms, the lack of a mechanism for transition from a crisis to a stabilization and sustainable development stage of the agrarian sector. All this requires the justification of the priorities of the agrarian policy and further market reforms in agriculture.

The main directions of the agrarian policy, the implementation of which would contribute to the stabilization and transition to economic growth in agriculture, needs to be improved. This requires economic stabilization and growth in industrial sectors, which, on the one hand, will increase the population's effective demand for food, and on the other, will expand the possibilities of state support for agricultural producers.

State support is considered by us in three main forms, among which are: direct (direct budget payments); indirect (budgetary funds are stimulating); indirect (through organizational and economic measures, often not directly related to the agrarian sector of the economy) (Kamenova 2010).

The variety of forms of state support contributed to the creation of a multi-channel system of state support for the industry. So, at republican level, we can distinguish the form of direct budget support that includes: provision of subsidies for agricultural production and material and technical resources; subsidizing short-term and investment lending to enterprises and organizations of the agro-industrial complex; the provision of subsidies for compensation of part of the costs of agricultural producers for crop insurance; subsidies for capital expenditures, etc.

A form of indirect support, at the same level, is to purchase agricultural products and food for state needs; regulation of the production market through purchasing and commodity interventions with grain; protection of economic interests of commodity producers in the implementation of foreign economic activity in the field of agriculture and others. The form of indirect support is represented by measures to ensure a favorable organizational and economic conditions for the functioning of agricultural producers. They include: measures to restructure the debt of agricultural producers in payments to the budget of all levels, state extra-budgetary funds, suppliers of energy and other material and technical resources; creating a special tax regime; support of agrarian science (Mikhailyuk 2016).

State support can be divided by the method of influence on the entity. So, direct forms of influence include those forms of budget financing, the funds of which directly affect the financial results of economic entities and imply targeted spending of funds to support agriculture. That is why the direct form of budget support is understood as budget support for agricultural producers, directly affecting their financial activities (we are talking mainly about subsidizing the production of agricultural products and raw materials).

Indirect support should be understood as a form of state support in which the impact on the results of financial and economic activities of agricultural producers is indirect, namely: through the implementation of leasing schemes, through crop insurance, the introduction of a uniform agricultural tax and other measures. In comparison with the previous form, government influence does not occur directly, but through indirect methods.

The indirect form of support is considered through the implementation of state measures of priority national projects. The developed classification criteria for state support of agriculture based on international experience are presented in Table 2. Special attention should be focused on: qualifications of managerial personnel in the agricultural sector; the willingness of farmers to adapt to innovations, to use the created conditions; real resources of the industry and their rational use. The state support system should be flexible, meet the tactical and strategic needs of the agro-industrial complex.

Table 2. Classification of state support for agriculture

Sign of	Type of state support	Definition
On the basis of budget financing	Budget	Provision of state support from the budget on the principles of co-financing, development and implementation of targeted programs for the development of the industry
	Off-budget	Tools and forms that do not require the expenditure of budget funds, in particular, banking, commercial lending, leasing, venture financing, etc.
By way of impact on agricultural production	Direct	Targeted financing, directly or indirectly affecting the profitability of agricultural enterprises (subsidies, compensation, subsidies, tax incentives to support certain groups of enterprises)
	Indirect	Influences agriculture through measures to regulate the agri-food market with the means of a complex of state regulation of the agricultural sector of the economy, including a number of relevant institutions

Sign of	Type of state support	Definition
By time factor	Short term	Up to one year
	Medium term	From one to three years
	Long term	More than three years
According to the requirements established by international organizations (WTO)	"Yellow basket"	Measures affecting the structure of international trade and causing additional flow of assets from consumers to producers and according to the standards falling under reduction after accession to the WTO (real estate loans; seasonal financing; dynamic financing in proportion to the number of livestock; dynamic financing in proportion to the land area; separate subsidy programs commercial loans, etc.)
	Green Basket	Activities that do not affect the conditions of world trade and carried out in the framework of government projects and programs carried out on funds received from tax revenues. Such measures do not cause additional flow of assets from consumers to producers and not falling under the restrictive rules of the WTO.
	"Blue basket"	Measures for the reimbursement of incomes not received by producers, not causing an increase in the supply of agricultural products and raw materials on the international market and not falling under the restrictive rules of the WTO (direct financing, on the terms of fixation of the areas being processed and the amount of products more than 85 percent of the basic production; direct payments to livestock producers, made on the conditions of stabilization of livestock, etc.)

Source: compiled by authors

The factors of low profit growth in the agrarian sector are also associated with the peculiarities of the demand for agricultural products and with the specific features of the industry, which, with weak government regulation, lead to the abuse of the market power of resource providers for agriculture, processing and trading organizations in relation to agriculture.

### 3. Case studies

From the data of Table 3 it can be seen that in the structure of the primary incomes of the enterprises of the agro-industrial complex, the largest share is taken by the net profit and the net mixed income. During the analyzed period, it averaged 64.8% of the gross value added. The net income of agricultural enterprises in 2016 amounted to 1,419.2 billion tenge, the size of which compared to 2012 increased by almost 60.5%. Labor costs in 2016 amounted to 22.1%, which is 2.8% less than the previous period, the size of which amounted to 472.9 billion tenge (Table 3, Figure 1).

Consumption of fixed capital (depreciation fund) and net profit are the primary incomes of enterprises and organizations that are part of the GRP and are created as value added in the process of distribution and remain with economic agents.

Table 3. Net profit and the net mixed income

Indicator		2012	2013	2014	2015	2016	2017
Release in basic prices	X <sub>1</sub>	2.450.175,1	2.828.871,6	2.962.218,5	3.704.132,9	3.989.279,1	4 372 976,2
Intermediate consumption	X <sub>2</sub>	1.120.141,5	1.207.639,1	1.244.432,5	1.778.266,4	1.849.271,5	2 048 616,4
Gross value added	Y	1.330.033,6	1.621.232,5	1.717.786,0	1.925.866,5	2.140.007,6	2 324 359,8

Source: compiled by authors

We consider it necessary, in the study being conducted, based on the provision of the key role of uncertainty in shaping economic development trends, to implement a multifactor model, allowing forecasting the development of the main factors listed in Table 3, which set the level of the development trend of Kazakhstan's economy for the period 2018-2020. Taking into account the proposed methodology, it is possible to carry out an assessment of the scenario of the country's economic development in the specified period.

Under the multivariate analysis refers to the method of integrated and systematic study and measurement of the impact of factors on the value of performance indicators.

In studying the patterns of economic phenomena, it is of great importance to identify the links between interconnected, developing in time phenomena, to conduct a related analysis of the dynamics. For this purpose, multifactor models of interconnected time series are built. When modeling multi-dimensional time series, correlation and regression analysis are of particular importance. Modeling of connected series of dynamics is based on the use of regression equations. Such models reflect the relationships that have developed between the studied

indicators with a sufficient degree of accuracy and allow us to estimate the degree of influence of individual factors on the resultant attribute, as well as the effectiveness of the influence of all factor factors.

As the studies described in the works of various authors have shown, the results of the forecasts of economic processes according to the model built on the basis of the dynamics are quite satisfactory. Therefore, it seems appropriate to consider in greater detail precisely this method of constructing a dynamic model of multifactor forecasting.

To develop a model in work, we use the method of correlation and regression analysis. Correlation represents a probable relationship between indicators that are not in a functional relationship. This method is used to determine the closeness of the relationship between indicators. The necessary initial data is taken from the Table 3 and calculate the parameters of the regression equation.

The multiple regression equation can be represented as:

$$Y = f(\beta, X) + \varepsilon \quad (1)$$

where:  $X = X(X_1, X_2, \dots, X_m)$  - is the vector of independent (explaining) variables;  $\beta$  - is the vector of parameters (to be determined);  $\varepsilon$  - is a random error (deviation);  $Y$  - dependent (explained) variable.

The theoretical linear multiple regression equation is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_m X_m + \varepsilon \quad (2)$$

where:  $\beta_0$  - is the free term that determines the value of  $Y$ , in the case when all explanatory variables  $X_j$  are 0.

The empirical equation of multiple regression is presented in the form:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + \dots + b_m X_m + e \quad (3)$$

where:  $b_0, b_1, \dots, b_m$  - estimates of theoretical values of the  $\beta_0, \beta_1, \beta_2, \dots, \beta_m$  regression coefficients (empirical regression coefficients);  $e$  - is the deviation estimate of  $\varepsilon$ .

When the least square method premises are fulfilled with respect to the  $\varepsilon_i$  errors, the estimates of  $b_0, b_1, \dots, b_m$  of the parameters  $\beta_0, \beta_1, \beta_2, \dots, \beta_m$  of the multiple linear regression with respect to the least square method are unbiased, effective and consistent. The least square method is used to estimate the parameters of the multiple regression equation. Determine the vector of estimates of the regression coefficients. According to the method of least squares, the vector  $s$  is obtained from the expression:  $s = (X^T X)^{-1} X^T Y$ . Add a single column to the matrix with  $X_j$  variables:

	$X_1$	$X_2$
1	2450175,1	1120141,5
1	2828871,6	1207639,1
1	2962218,5	1244432,5
1	3704132,9	1778266,4
1	3989279,1	1849271,5
1	4372976,2	2048616,4

Matrix  $Y$

1330033,6
1621232,5
1717786
1925866,5
2140007,6
2324359,8

Matrix  $X^T$

1	1	1	1	1	1
2450175,1	2828871,6	2962218,5	3704132,9	3989279,1	4372976,2
1120141,5	1207639,1	1244432,5	1778266,4	1849271,5	2048616,4

Multiply matrices,  $(X^T X)$

$X^T X =$	6	20307653,4	9248367,4
	20307653,4	71538480116014	32769825720827
	9248367,4	32769825720827	15040587047357

In the matrix,  $(X^T X)$ , the number 6, which lies at the intersection of the 1st row and 1st column, is obtained as the sum of the products of the elements of the 1st row of the  $X^T$  matrix and the 1st column of the  $X$  matrix.

Multiply matrices,  $(X^T Y)$ :

$$X^T Y = \begin{array}{|c|} \hline 11059286 \\ \hline 38768654395187 \\ \hline 17729238673470 \\ \hline \end{array}$$

Find the inverse matrix  $(X^T X)^{-1}$ :

$$(X^T X)^{-1} = \begin{array}{|c|c|c|} \hline 7,311 & -8,0E-6 & 1,3E-5 \\ \hline -8,0E-6 & 0 & 0 \\ \hline 1,3E-5 & 0 & 0 \\ \hline \end{array}$$

The vector of regression coefficient estimates is:

$$Y(X) = \begin{array}{|c|c|c|} \hline 7,311 & -8,0E-6 & 1,3E-5 \\ \hline -8,0E-6 & 0 & 0 \\ \hline 1,3E-5 & 0 & 0 \\ \hline \end{array} * \begin{array}{|c|} \hline 11059286 \\ \hline 38768654395187 \\ \hline 17729238673470 \\ \hline \end{array} = \begin{array}{|c|} \hline 1,146 \\ \hline -40,762 \\ \hline 147,42 \\ \hline \end{array}$$

Regression equation (regression equation estimate):

$$Y = 1,1461 - 40,7622 \cdot X_1 + 147,4203 \cdot X_2.$$

Paired correlation coefficients  $R$ :  $r_{xy} = \frac{\overline{x \cdot y} - \bar{x} \cdot \bar{y}}{s(x) \cdot s(y)}$ ;

$$r_{yx1} = \frac{6461442399197,9 - 3384608,9 \cdot 1843214,33}{683741,63 \cdot 330348,62} = 0,987;$$

$$r_{yx2} = \frac{2954873112245 - 1541394,57 \cdot 1843214,33}{361755,85 \cdot 330348,62} = 0,952;$$

$$r_{x1x2} = \frac{5461637620137,9 - 1541394,57 \cdot 3384608,9}{361755,85 \cdot 683741,63} = 0,989;$$

Calculate the observed values of t-statistics for  $r_{yx1}$  using the formula:

$$r_{nabl} = r_{yx1} \frac{\sqrt{n-m-1}}{\sqrt{1-r_{yx1}^2}} \quad (5)$$

where:  $m = 1$  - number of factors in the regression equation.

$$r_{nabl} = 0,99 \frac{\sqrt{6-1-1}}{\sqrt{1-0,99^2}} = 12,17$$

According to the student's table we find according to the table:  $T_{cr}(n-m-1; \alpha/2) = (4; 0.025) = 2.776$ . Since  $t_{obs} > t_{crit}$ , then we reject the hypothesis of equality 0 of the correlation coefficient. In other words, the correlation coefficient is statistically significant.

Calculate the observed values of t-statistics for  $r_{yx2}$  using the formula:

$$r_{nabl} = 0,95 \frac{\sqrt{6-1-1}}{\sqrt{1-0,95^2}} = 6,21$$

Since  $t_{obs} > t_{crit}$ , then we reject the hypothesis of equality 0 of the correlation coefficient. In other words, the correlation coefficient is statistically significant.

Let us turn to the statistical analysis of the obtained regression equation: checking the significance of the equation and its coefficients, the study of absolute and relative approximation errors.

For an unbiased estimate of variance, we do the following calculations:

- Unbiased error  $\varepsilon = Y - Y(x) = Y - X * s$  (absolute error of approximation)

Y	Y(x)	$\varepsilon = Y - Y(x)$	$\varepsilon^2$	$(Y - Y_{av})^2$	$ \varepsilon : Y $
1330033,6	65257064,303	-63927030,703	4,0866652544942E+15	263354465064,53	48,064
1621232,5	62719484,953	-61098252,453	3,7329964528298E+15	49275934330,026	37,686
1717786	62708066,146	-60990280,146	3,7198142723417E+15	15732266802,777	35,505
1925866,5	111163951,628	-109238085,128	1,1932959242393E+16	6831380654,695	56,722
2140007,6	110008358,76	-107868351,16	1,1635581182066E+16	88086243138,673	50,406
2324359,8	123755504,532	-121431144,732	1,4745522910948E+16	231500960093,89	52,243
			4,9853539315072E+16	654781250084,59	280,626

- Estimation of the standard deviation (standard error for estimating Y):

$$S = \sqrt{S^2} = 27,35$$

The tightness of the joint influence of factors on the result is estimated by the multiple correlation index. Unlike the pair correlation coefficient, which can take negative values, it takes values from 0 to 1.

Therefore, R cannot be used to interpret the direction of communication. The denser the actual values of  $y_i$  are relative to the regression line, the smaller the residual variance and, consequently, the larger the value of  $R_y(x_1, \dots, x_m)$ .

Thus, if the value of R is close to 1, the regression equation better describes the actual data and factors have a greater effect on the result. When the value of R is close to 0, the regression equation poorly describes the actual data and factors have a weak effect on the result.

$$\text{Multiple correlation coefficient } R = \sqrt{1 - \frac{0,32}{0,0219}} = 0,932$$

The relationship between the Y sign and the  $X_i$  factors is strong. We will calculate the correlation coefficient using the known values of linear pair correlation coefficients and  $\beta$ -coefficients.

$$R = \sqrt{\sum r_{yxi} \beta_{yxi}} = \sqrt{r_{yx1} \beta_{yx1} + r_{yx2} \beta_{yx2}} \quad (6)$$

$$R = \sqrt{0,987 \cdot 2,07 + 0,952(-1,095)} = 0,824$$

$$\text{Coefficient of determination: } R^2 = 0,932^2 = 0,868$$

The assessment of the significance of the multiple regression equation is carried out by testing the hypothesis of zero equality coefficient of determination calculated according to the general population:  $R^2$  or  $b_1 = b_2 = \dots = b_m = 0$  (hypothesis about the insignificance of the regression equation calculated according to the general population).

To test it, use Fisher's F-test. At the same time, the actual (observable) value of the F-criterion is calculated through the coefficient of determination  $R^2$ , calculated from the data of a specific observation.

According to the Fisher-Snedococor distribution tables, the critical value of the F-criterion ( $F_{cr}$ ) is found. To do this, set the level of significance  $\alpha$  (usually it is taken equal to 0.05) and two numbers of degrees of freedom  $k_1 = m$  and  $k_2 = n - m - 1$ .

Check the hypothesis of general significance - the hypothesis of simultaneous equality to zero of all regression coefficients with explanatory variables:

$$H_0: R^2 = 0; \beta_1 = \beta_2 = \dots = \beta_m = 0.$$

$$H_1: R^2 \neq 0.$$

Testing of this hypothesis is carried out using F-statistics of the Fisher distribution (right-handed verification). If  $F < F_{cr} = F_{\alpha; n-m-1}$ , there is no reason to reject the hypothesis  $H_0$ .

$$F = \frac{R^2}{1 - R^2} \frac{n - m - 1}{m} = \frac{1}{1 - 0,868} \frac{6 - 2 - 1}{2} = 11,363$$



Tabular value with degrees of freedom  $k_1 = 2$  and  $k_2 = n - m - 1 = 6 - 2 - 1 = 3$ ,  $F_{cr}(2; 3) = 9.55$ . Since the actual value of  $F > F_{cr}$ , the coefficient of determination is statistically significant and the regression equation is statistically reliable (the combined significance of the coefficients at factors  $x_i$  is confirmed).

Table 4. Expected values of the estimated indicators of the economy of the Republic of Kazakhstan, in million tenge

Indicator	2018	2019	2020
Release in basic prices	2.450.175,1	282.8871,6	2.962.218,5
Intermediate consumption	1.120.141,5	1.207.639,1	1.244.432,5
Gross value added	1.330.033,6	1.621.232,5	1.717.786,0

Source: compiled and calculated by authors

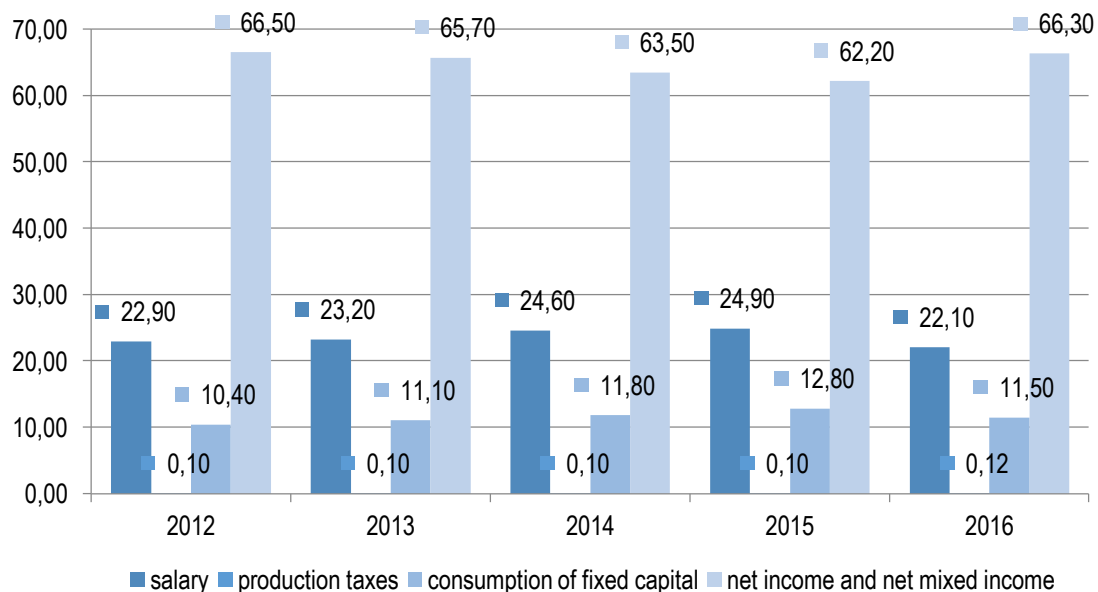
As a result of the calculations, a multiple regression equation was obtained:

$$Y = 1,1461 - 40,7622 \cdot X_1 + 147,4203 \cdot X_2$$

An economic interpretation of the model parameters is possible: an increase of  $X_1$  by 1 unit. Leads to a decrease in  $Y$  by an average of 40.762 units; an increase of  $X_2$  by 1 unit. leads to an increase in  $Y$  by an average of 147,42 units. By the maximum coefficient  $\beta_1 = 2.07$  we conclude that factor  $X_1$  has the greatest influence on the result of  $Y$ .

The statistical significance of the equation is verified using the coefficient of determination and the Fisher criterion. It is established that in the situation under study, 100% of the total variability of  $Y$  is explained by a change in the factors  $X_j$ . It was also established that the parameters of the model are not statistically significant.

Figure 1. The structure of the gross value added of agricultural products, in %



Source: compiled by authors

Consumption of fixed capital is the sum of the decrease in the value of fixed capital as a result of its physical and moral depreciation, that is, the size of depreciation deductions from the value of fixed assets of enterprises is also a source of financial resources for agricultural enterprises. However, their share in the revenue structure is insignificant and in the analyzed period, on average, it is 11.5% and tends to decrease from 12.8% in 2015 to 11.5% in 2016, which indicates negative processes, since this source of financial resources of economic entities should play a significant role in investment processes. This once again demonstrates that domestic enterprises of the agro-industrial complex are not actively engaged in the problems of introducing advanced technology, they use physically and morally outdated equipment in production.

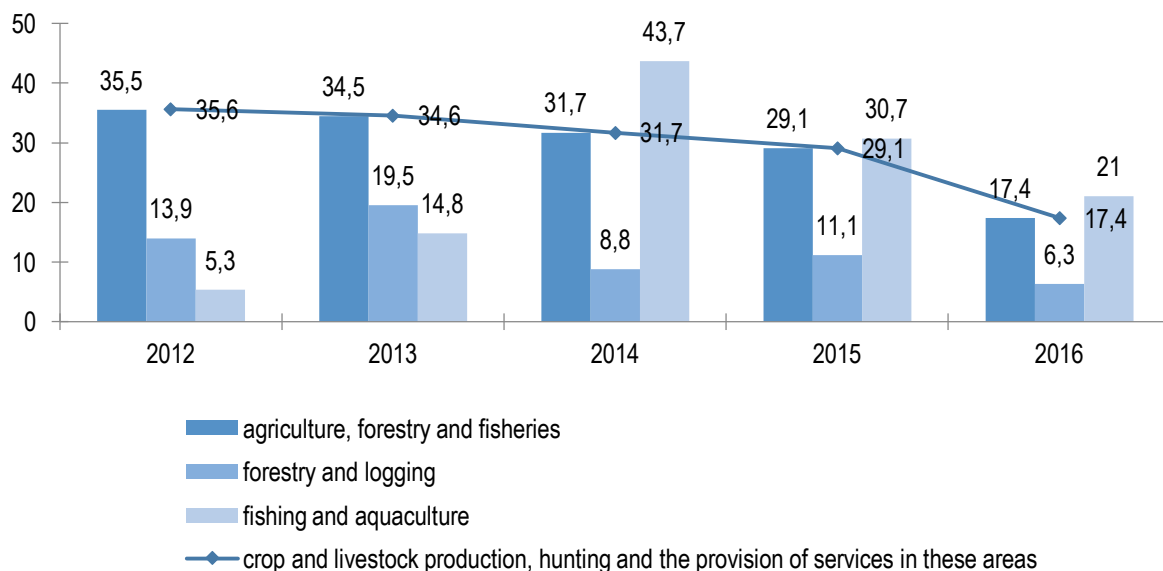
The low level of technical equipment of agricultural production is the main deterrent to its effective development, the reason for the simplification of crop cultivation technologies, the spread of pests, plant diseases, the loss of soil humus and ultimately a decrease in product quality. The average age of the current fleet of tractors and combines is 13-14 years, with a regulatory life of 7-10 years. The technical readiness ratio of the existing

equipment does not exceed 0.7, and the load per unit of technology exceeds the standard by 1.2-1.6 times (Figure 2).

One of the main sources of financing investments should be depreciation. The experience of developed countries shows that depreciation is considered as the main source of domestic investment funds of companies. As noted earlier, in countries with a developed, established market economy, more than half of all invested funds in fixed assets are provided through depreciation. The technical potential accumulated over decades, and the orientation towards an intensive renovation of the property basis, have allowed foreign companies to form a production capacity today that can not only meet the current needs of production, but also develop according to scientific and technical progress. The depreciation system should take into account the real state of the main incomes in various sectors of the economy, the degree of their use in the production process and the financial situation of economic entities. Therefore, its improvement should not lead to an increase in costs relative to the volume of goods produced, work performed and services rendered and thereby affect the true financial situation of economic entities, prices and inflation in the country.

In this regard, in the Republic it is advisable to develop a new depreciation system taking into account the experience of foreign countries on the basis of a comprehensive analysis of fixed assets and revaluation of their value. At the same time, the procedure for accounting for depreciation charges should be fully linked to the accounting system in the republic, which is implemented using international standards.

Figure 2. The rate of renewal of fixed assets for 2012-2016, in %



Source: compiled by authors

The Tax Code of the Republic of Kazakhstan provided for a new depreciation system, which includes the method of accelerated depreciation. In accordance with the new system, the useful life of an asset is determined through depreciation rates related to the categories into which assets are divided and the cost of their acquisition. This useful life may not always correspond to the true economic and production life of the asset. Therefore, the compliance of revenues and costs may be inaccurate, the profit of the business entity will not reflect its true financial position.

In this regard, the system of depreciation deductions in the republic has not become one of the tools for updating fixed assets and other assets of economic entities, but is a mechanism for increasing their costs.

International accounting standards require a distinction between revenue and profit in financial statements. The revenue represents the income of an economic entity from the main and production activities, and the profit also comes from casual or non-core activities. This distinction is used in the preparation and presentation of financial statements in all countries that have adopted a conceptual plan of international accounting standards. Such a requirement exists because investors, other users of financial statements need to know whether the income (profit) of the economic entity was received as a result of the main and production activities or other events. Consequently, the improvement of the depreciation system requires a significant revision of the accounting of the main income in the republic (Maslov 2010).

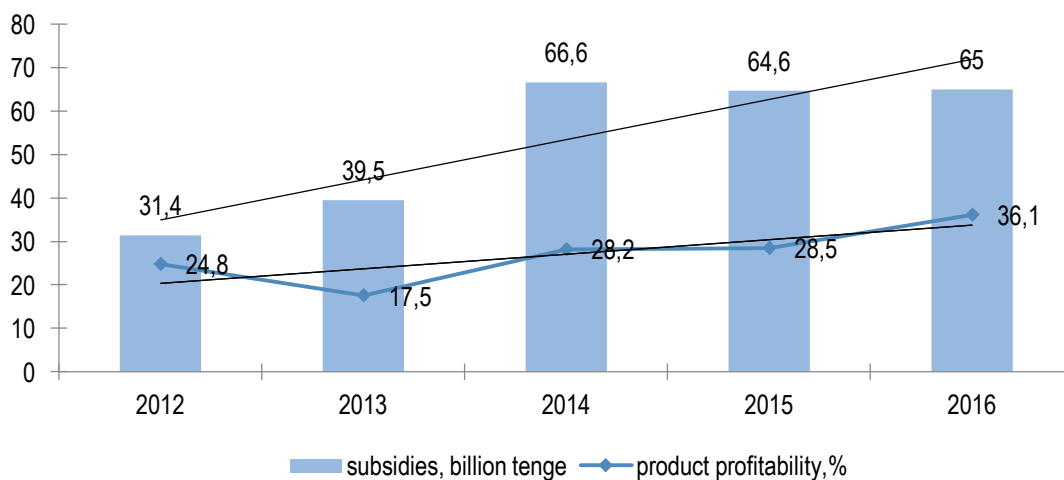
The specificity of the formation of fixed assets mainly due to their own resources due to their limitedness reduces the possibility of expanded reproduction in the system of agricultural production.

Analyzing the trends in the financial resources of business entities, the author came to the conclusion that when developing the concept of financial sustainability of agricultural producers and forming their financial strategy, it is necessary to develop a system for forming the required amount of financial resources for strategic development. The main stages of the development of the proposed methodology, taking into account the specifics of the industry, are:

- determination of the necessary need for financial resources, taking into account own and borrowed funds (Aimurzina, Kamenova Omarova 2018);
- determining the amount of own financial resources from domestic sources (net profit, depreciation);
- justification of the volume of attracted own financial resources from external sources (Aimurzina, Kamenova, Omarova 2018).

The experience of developed countries shows that the time has come to improve the forms and methods of state support, the formation of new mechanisms for its implementation. The most important point is to increase subsidies to the agricultural sector. In this connection, the problem of rationalization and improvement of state regulation of agricultural production through budgetary instruments of influence, in our opinion, remains today. The calculations show a direct relationship between the size of allocated subsidies and the financial performance of enterprises in the agricultural sector, can be clearly seen in Figure 3.

Figure 3. The relationship between the size of allocated subsidies and the financial performance of enterprises in the agricultural sector



Source: compiled by authors

As the analysis of the results of the production and financial activities of agricultural enterprises and the processing industry in recent years has shown, most agricultural units are unprofitable or receive insignificant profits, which do not allow them to carry out expanded reproduction. A larger number of agricultural entities under consideration are insolvent; they cannot pay current liabilities on an urgent basis, since they have a low level of liquidity of current assets (cash, short-term investments, receivables, other assets). The share of own funds in the total amount of resources does not reach the normative level, therefore, their financial dependence on external factors is very high.

## Conclusion

Thus, the purpose of implementing measures to increase the availability of credit and attract investment is to increase the financial sustainability of agricultural organizations and peasant farms, including individual entrepreneurs, and organizations engaged in primary and subsequent (industrial) processing of agricultural products.

Calculations of the coefficient of variation showed that the impact of the allocated subsidies on the number of bankrupt enterprises and financial performance of enterprises in the agricultural sector of the Akmola region for 2014-2017 is very significant and is 85.1% and 44.9%, which indicates the close relationship of these indicators (Table 5).

Table 5. Impact of subsidies and loans on the number of unprofitable of bankrupt farms of the agricultural sector of the Akmola region for 2014 - 2017

Years	The size of subsidies, in mln. tenge	The number of unprofitable farms-bankrupts, in units
2014	976,6	50
2015	2.448,6	62
2016	10.211, 2	73
2017	11.600,0	20
The average	6.309,2	51
Standard deviation	5.371,5	22,9
Variation, in %	85,1%	44,9

Source: compiled by authors

The sum of the standard deviations is determined using the calculation Table 6.

Table 6. Standard deviations

Years	Linear deviations	Squares of linear deviations
2014	-1 (50-51)	1
2015	11 (62-51)	121
2016	22 (73-51)	484
2017	- 31 (20-51)	961
Sum of linear deviations =1		1567

Source: compiled by authors

Also, to ensure the required increase in own financial resources from internal and external sources, it is necessary to look for opportunities to increase sales and reduce costs, apply accelerated depreciation methods, and direct up to 60% of net profit for reproduction purposes. In order to account for funds intended to cover investment costs, it is necessary to amend the accounting legislation allowing the opening of a special "investment" financing account for a strictly targeted purpose.

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## Gender Differences in Behavior Patterns in Voluntary Pension Systems

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### Abstract:

This article tests four hypotheses about gender differences related to membership in voluntary pension systems in Eastern European countries that belong to different groups "aging, early reformers" (Romania) and "aging, late reformers" (Ukraine). In order to test the hypotheses, we consistently applied three methods to time series of participants' growth rates in the Pillar III of Romanian and Ukraine pension systems: cyclical analysis of time series using the Hodrick-Prescott filter, fractal analysis by conducting Rescaled Range Analysis (R/S-analysis) of time series, and phase analysis of time series. All three methods have confirmed the hypothesis that the parameters of nonlinear behavior depend on gender. R/S-analysis showed that the behavior of men and women in both countries is antipersistent behavior with short-term memory, but the gender gap in Hurst exponent estimates is greater in Romania than in Ukraine. Using fractal and phase analysis, we confirmed the hypothesis that gender differences in behavior patterns increase as financial and stock markets develop, as the gender gap in financial knowledge increases. However, at given the level of significance, the hypothesis that economic fluctuations affect behavior patterns, and the level of influence depends on gender has not been confirmed.

**Keywords:** gender pension gap; Hodrick-Prescott filter; fractal analysis; phase analysis; quasi-cycle; Romania; Ukraine

**JEL Classification:** C52; D14; J32

### Introduction

The pension crisis of provision in the context of global demographic aging and gender differences in both the labor market and financial literacy lead to an uneven gender structure of beneficiaries of pensions in modern society. The average EU28 gender pension gap in 2014 stood at 40.2% (40.7% in 2013). In many Eastern European countries, the gender pension gap tends to be much lower than in Western Europe (e.g. the gap in Romania in 2013 stood at 28.1%, but in 2014 it increased to 35.3%) (Lodovici *et al.* 2016). This is due to the fact that in Eastern European countries gender differences in the use of part-time work are less pronounced, as well as low pension incomes for men and women. The pension gap is much higher than the average EU gender pay gap (16.1% in 2014) (Lodovici *et al.* 2016). This raises the question of whether there are differences in the behavior of men and women in voluntary pension systems, which will lead to a gender gap in private retirement income? The purpose of this study is to test four hypotheses about behavior patterns regarding membership in voluntary pension systems, using data from the 3rd pillar of pension systems in Romania and Ukraine: H1: Parameters of nonlinear (cyclical) behavior depend on gender; H2: Economic fluctuations affect behavior patterns, and the level of influence depends on gender; H3: Behavior patterns are fractal in nature, and fractal properties depend on gender; H4: Gender differences in behavior patterns increase as financial and stock markets develop, as the gender gap in financial knowledge increases.

### 1. Literature Review

Issues related to gender differences in pension provision have been the topic of scholarly research since the 1980s. Basically, these are studies of gender gaps in such aspects as (i) pension coverage and retirement income, (ii) retirement patterns, and (iii) decisions on pension investments or retirement savings. The studies were based on data from different countries and used different methods.

Even and Macpherson (1994) used multivariate analysis to examine the gender gap in employee pension coverage and benefits in the US. They showed that the gap in coverage will be higher among the retired than the employed, since (i) the proportion of women in the labor force is lower than that of men, and (ii) pension coverage for women is less likely to convert into retirement benefit because they have shorter job tenure on average, but (iii) the gender gap in coverage narrowed significantly during the 1980s due to the convergence of labor market

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characteristics for men and women. It is likely that the convergence of the characteristics of the male and female labor markets has led to a reduction in the gender gap in the coverage of private pension systems in many countries. For example, a later study (Antolin *et al.* 2012) showed that in Germany, the UK and the US, the gender gap in coverage of private pension plans is negligible; the largest gender gap is observed in the Netherlands (16.4 percentage points), followed by Ireland (10.3 p.p.), Italy (5.4 p.p.), and Spain (3.0 p.p.). At the same time, Barrientos (1998) concludes that in Chile, the absence of a gender gap in private pension coverage is largely due to the “women's strong pension propensities and pension plan design”.

Bardasi and Jenkins (2010) study the gender gap in private pensions in Britain, applying the Gomulka-Stern and Blinder-Oaxaca decomposition methods to a joint model of the probability of private pension income receipt and of private pension income amounts conditional on receipt; and show that “gaps are associated mainly with gender differences in returns to personal characteristics rather than with gender differences in personal characteristics per se”. Ezeyi and Vujic (2017) investigate the gender gap in state and private pensions in England, also using the Blinder-Oaxaca decompositions and quantile regressions. They found the gender pension gap is more marked for private pensions than state pensions and the gender differentials in characteristics matter more for private pension coverage rates than private pension income levels. Using scenario modeling and actuarial calculations, Belloni and Fornero (2008) examine how a working career affects gender differences in retirement income and offer options for correcting the Defined Benefit (DB) scheme to improve the relative position of women with discontinuous or poor careers.

Other studies have found that there are gender differences in retirement patterns. For example, Dahl *et al.* (2002) investigated gender differences in early retirement behavior in Norway and, using a competing risk model, found that women are less likely to take early retirement compared to men and that these differences are due to both different characteristics and different behaviors. Using a multinomial logistic regression model and a model of phased retirement, Cahill *et al.* (2013) came to the conclusion that gender differences with respect to the retirement patterns of the Early Boomers in the US “are more the result of macroeconomic influences that have had a disproportionate impact on men and women, most notably through involuntary transitions from career employment and the likelihood of finding subsequent bridge employment”.

The third area of research concerns gender differences in making decisions on pension investments or pension savings. Hinz *et al.* (1997), using the Tobit models, find that women invest in lower-risk pension portfolios than men, and as a consequence, they hold less in the stock funds than men. Bajtelsmita *et al.* (1999) also confirm that women are not prone to risk in making pension decisions, and it is likely that they will retire with much lower pensions than men. In the study, the authors used probit regression and estimated the coefficient of relative risk aversion based on the allocation of wealth into Defined Contribution (DC) pensions. Gerrans and Clark-Murphy (2004) revealed gender differences in the decisions of Scheme for Australian Universities members who were presented with a choice between staying with a DB Fund or moving to one of four Investment Accumulation Accounts strategies; a logistic regression framework was used to examine the choices. However, as well as in previous studies, the gender gap is not uniform and “can be demonstrated as depending on marital status, whether the member considered themselves informed and age”. Foster and Smetherham (2013) examined the impact of various characteristics on the on the likelihood of women contributing to a private pension, such as educational attainments, income, occupational group, full-time/part-time status, and whether an individual has any dependent children.

In this regard, should be noted that financial literacy is closely tied to retirement planning and retirement wealth accumulation (Lusardi and Mitchell 2011). For example, Behrman *et al.* (2010) showed this using an instrumental variable approach. In addition, Lusardi and Mitchell (2008, 2011) indicate a common pattern: women are less financially literate than men, and are less likely to plan retirement and be successful planners. Lusardi *et al.* (2014) using multiplicative regression models of financial sophistication showed that older women are consistently less financially savvy than men.

Our study differs from the studies mentioned above in the following aspects. First, in our study, special attention is paid to the nonlinear behavior of participants in voluntary pension provision and the impact of economic cyclicity on this behavior. Secondly, our data allow us to identify gender differences in behavior patterns regarding membership in voluntary pension systems in Eastern European countries that belong to different groups according to Chawla *et al.* (2007): “aging, early reformers” (Romania) and “aging, late reformers” (Ukraine). Finally, we are trying to use a combination of methods (cyclical, fractal, and phase analysis of time series) that were not previously used in studies of gender pension differences.

## 2. Methodology

To test these hypotheses about behavior patterns regarding membership in voluntary pension systems, we use the time series of the growth rates of participants in Pillar III of the Romanian and Ukrainian pension systems (referred to here as the pension time series). We are interested in using and comparing three types of assessments (analysis) of non-linear behavior of men and women: (i) cyclical analysis of pension time series using Hodrick-Prescott filter (HP filter); (ii) fractal analysis by conducting Rescaled Range Analysis (R/S-analysis) of pension time series, and (iii) phase analysis of pension time series.

In order to identify long-term trends and possible cyclical fluctuations using the HP filter (Hodrick and Prescott 1997), the time series of participants' growth rates  $Y = (y_1, y_2, \dots, y_T)'$  are decomposed into a trend component  $\tau = (\tau_1, \tau_2, \dots, \tau_T)'$  and a cycle component  $C = (c_1, c_2, \dots, c_T)'$ . Mathematical details are described in more detail in our previous paper (Yakimova 2018). To identify the turning points of cycles, the so-called peaks and troughs, we use a modified empirical rule of "two consecutive negative (positive) growth rates" (Krznar 2011): the point  $c_t$  is the turning point if (i)  $\Delta c_t > 0$  and  $\Delta c_{t+1} < 0$  and  $\Delta c_{t+2} < 0$  for peak; (ii)  $\Delta c_t < 0$  and  $\Delta c_{t+1} > 0$  and  $\Delta c_{t+2} > 0$  for trough. As for the length of the cycle, the "cycle can be defined from trough to trough or from peak to peak; the choice is largely a matter of convention" (Fuchs 1968, 162). We will define the cycle "from trough to trough".

For the analysis of cycling, volatility and persistence of time series of cyclical components are calculated. The formal measure of the persistence of cycles (cyclical persistence) is the autocorrelation coefficient  $r_1 = \text{corr}(c_t, c_{t-1})$ . The volatility of participants' growth rates is used not only to compare male and female behavior, but is also important for determining the impact of economic fluctuations and to assess the sustainability of pension systems since volatility is synonymous with risk. The formal measure of absolute volatility of cyclical fluctuations (cyclical volatility) is the standard deviation of the series  $\sigma_c$ .

To identify the relationship between economic fluctuations and the behavior of men and women in the private pension market, relative cyclical volatility is used, calculated as the ratio of standard deviations of pension time series  $\sigma_c$  and time series of GDP growth  $\sigma_{c\_GDP}$ ; GDP growth is used as a measure of the business cycle.

In addition, the types of behavior patterns in relation to the business cycle and timing are determined. Algorithm for identifying behavior patterns in relation to economic fluctuations is the standard testing of significance of the correlation coefficient  $\rho(0) = \text{corr}(c, c_{GDP})$  using the Student t-test. Checks the null hypothesis  $H_0: \rho(0) = 0$ , *i.e.*, the correlation coefficient is insignificant, and the behavior is acyclic. An alternative hypothesis ( $H_A: \rho(0) \neq 0$ ) is divided into two hypotheses:  $H_{A1}: \rho(0) > 0$ , *i.e.*, the correlation coefficient is significant, and the behavior is procyclical;  $H_{A2}: \rho(0) < 0$ , *i.e.*, the correlation coefficient is significant, and the indicator is countercyclical. The probability of a type I error or significance level in this study is set at  $\alpha \leq 0.05$ .

The identification of timing types of behavior patterns is based on the following rules: (i) if the cross-correlation coefficient reaches its maximum  $\rho_{max}(k) = \max \{\rho(k) = \text{corr}(c_{t+k}, c_{GDPt})\}$  at  $k < 0$ , the behavior is a leading indicator of business cycle turning points (the behavior outstrips the business cycle for  $k$  periods) with a given level of significance  $\alpha$ ; (ii) if  $\rho_{max}(k)$  at  $k > 0$ , the behavior is a lagging indicator (the behavior lags behind the business cycle for  $k$  periods); (iii) if  $\rho_{max}(k)$  at  $k = 0$ , the behavior is a coincident indicator. It is important to note that when identifying the types of behavior patterns, time series of normalized cyclic components are used.

To test the fractal properties of pension time series, we will use Rescaled Range Analysis (R/S-analysis) (Peters 1994, 1996). Peters extended Hurst's method of studying time series of natural phenomena (Hurst 1951) to time series in the economy and capital markets. The measure of the smoothness of fractal time series is the Hurst exponent. In order to calculate the Hurst exponent, we use OLS for estimating the unknown parameters in the logarithmic version of Hurst's equation, *i.e.*:

$$\log(R/S)_n = \log(c) + H \cdot \log(n) \quad (1)$$

where:  $(R/S)_n$  is the average value of the rescaled range of cumulative deviations for each sub-periods of length  $n$ ,  $H$  is the Hurst exponent, and  $c$  is a constant.

For details, see Peters (1996, 62-63), Kale and Butar (2011, 11-12).

The Hurst exponent  $H$  is directly related to the fractal dimension  $Df$ , which measures the smoothness of a surface (in this study, the smoothness of pension time series). A direct relation between  $Df$  and  $H$  is:  $Df = 2 - H$ . In order to analyze the behavior of participants in voluntary pension systems (including pension time series graphs), the properties of the Hurst exponent  $H$  and the fractal dimension  $Df$  can be summarized as follows:

- $0 < H < 1$  and  $1 < Df < 2$ ;
- $H = 0.5$  reflects the Brownian motion (random walk); the fractal dimension  $Df = 1.5$  half away from 1 (the Euclidean dimension of a line) and 2 (the Euclidean dimension of a plane).

- $H < 0.5$  reflects anti-persistent behavior with short-term memory (the correlation between the past and the future is negative); the fractal dimension  $Df > 1.5$ , and the pension time series graph is a more jagged curve than for a random walk; each positive "tooth" is almost always compensated by a negative "tooth" of a similar size, and vice versa (reversion to the mean).
- $H > 0.5$  reflects persistent, inertial behavior with long-term memory (the correlation between the past and the future is positive); the fractal dimension  $Df < 1.5$ , and the time series graph is a less "noisy" (smoother) curve than for a random walk.

It should be noted that "the term "fractional noise" is justified by considerations from spectral theory" (Mandelbrot and Wallis 1969). The noise color for the time series will be determined as follows (Mandelbrot and Wallis 1969, Chardantsev 2005): (i) the value of  $H$  in the neighborhood of  $0.5 \pm 0.1$ , i.e. in the interval (0.4, 0.6) characterizes white (Gaussian) noise; (ii)  $0.3 \pm 0.1$  (0.2, 0.4) is pink noise; (iii) (0, 0.1) is red noise (also known as Brown noise); (iv) (0.6, 1) is black noise or is practically absent.

Thus, in the black noise range, the time series show the maximum persistence, and the memory (cycles) has the greatest length; in the red noise range, the time series show the maximum anti-persistence and the highest volatility, and the memory (cycles) has the smallest length, in other words, behavioral memory is practically nonexistent. To find the length of the memory (the length of cycles), uses the  $V$ -statistic of periodicity, determined by the formula:

$$V_n = (R/S)_n / \sqrt{n}. \quad (2)$$

Peters (1996) proposes to draw a curve in the coordinates  $\log(n) - V_n$ ; this ratio shows an obvious maximum when  $R/S$  ceases to grow as a square root of time. This is often a sign of the existence of a periodic or non-periodic cycle (this maximum should be insensitive to the time step in the initial time series).

Finally, in order to clarify the cyclic properties of time series of participants' growth rates, we use phase analysis. The analysis procedure involves three basic steps.

*Step 1.* Choice of the dimension  $\rho$  of the phase space  $\Phi(Y) = \{(y_i, y_{i+1})\}$ ,  $i = 1, 2, \dots, n-1$ . For economic time series, and consequently pension series, it is sufficient to construct a phase portrait in a phase space of dimension  $\rho = 2$ .

*Step 2.* Restoration of the phase portrait. In order to construct a true phase space, it is necessary to know all the variables relevant to the system. Packard *et al.* (1980) described a simple method developed by David Ruelle to reconstruct the phase space from one dynamic variable. This method fills other dimensions by delaying the values of one observable variable (Peters 1996).

*Step 3.* Decomposition of the phase portrait into quasi-cycles. The decomposition of the phase portrait into quasi cycles is essentially based on visualization of the graphical representation of the fragments of the phase portrait. The difference between a "quasi-cycle" and a "cycle" is as follows: (i) the initial and final points of the quasi-cycle do not necessarily have to coincide; (ii) the final point of a quasi-cycle is determined by its occurrence in a neighborhood of the initial point; (iii) self-intersection of the initial and final links of a quasi-cycle is allowed, if this leads to the best approximation of its initial and final points.

It is important to note that this procedure does not provide statistical analysis, since a short history of voluntary pension provision causes small samples.

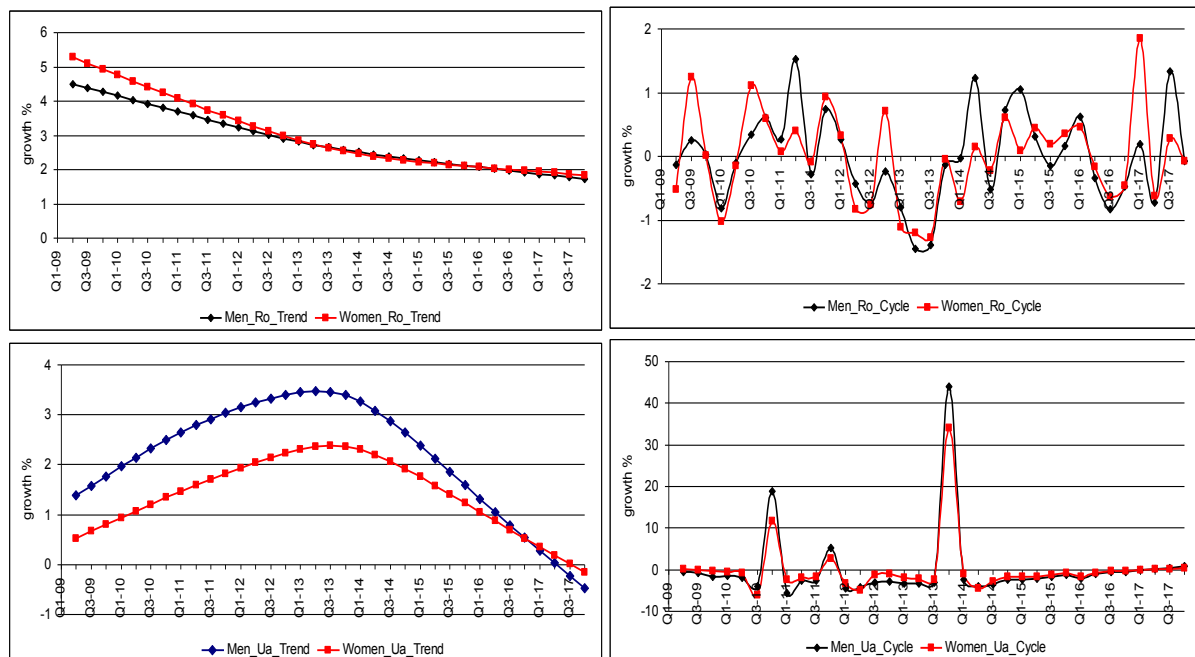
### 3. Case studies

The comparative study of gender differences in behavior patterns was carried out based on data on the number of participants in Pillar III in Romania and Ukraine collected from official websites (Financial Supervisory Authority 2018; National Commission for Regulation of Financial Services Markets 2018). In order to correctly compare gender gaps in these countries, we studied quarterly series for the period 2009 through 2017; in order to identify the gender gap in Romania, we further investigated the monthly series for the period 31.12.08 through 31.12.17; we deliberately did not make a seasonal adjustment, since the purpose of this study is a comparative analysis of actual pension behavior.

In order to conduct a cyclical analysis of time series of participants' growth rates, we have decomposed all the series into trends and cycles using the HP filter with a smoothing parameter is  $\lambda = 1600$  for quarterly data. Figure 1 illustrates the following differences in the behavior of men and women. In Romania, there is a steady decreasing trend for both men and women, but the rate of reduction in the growth of new female participants is greater than that of male participants. How can this be explained? Probably, women more trusted the new pension system with its introduction, but the desire to participate in it was lost faster than for men. Curves of cyclic

components also show greater instability in the behavior of women than men; as a rule, the amplitude of cyclical fluctuations for time series of women is greater; nevertheless, the timing of peaks and troughs tend to coincide.

Figure 1. Trends and cyclic components of time series of participants' growth rates in Romanian and Ukrainian voluntary pension systems by gender (quarterly aggregation)



Source: Author's elaboration based on Financial Supervisory Authority (2018) and National Commission for Regulation of Financial Services Markets (2018)

Figure 1 also illustrates the dates of the turning points of cycles that were defined by the empirical rule. For the time series of men, these are troughs: Q1-10, Q2-13, Q3-16; and peaks: Q2-11, Q2-14, Q3-17. For the time series of women these are troughs: Q1-10, Q3-13, Q3-16; and peaks: Q3-11, Q4-14, Q1-17. It should be noted that “unstable” turning points have been identified, for example, in the second cycle of men there are two “unstable” troughs Q3-14 and Q3-15 (for them  $\Delta C_{t+3} < 0$ ). Probably, beginning in 2014, the effect of the third quarter (Q3-trough) is observed in the pension behavior of men. This same calendar anomaly is also observed in the behavior of women, but not so steadily as in the behavior of men. Thus, the lengths of quasi-cycles, taking into account the unstable troughs, are equal to 4, 5, 13 quarters for men and 4, 5, 8, 9 quarters for women. But we recall that to refine the length of quasi-cycles, we will additionally use other methods of analysis.

In Ukraine, trends for both men and women are bell-shaped curves with a peak in 2013 (Q2-13 for men and Q3-13 for women). The crisis of 2013-2014, the subsequent annexation of territories, military actions and the resulting economic downturn caused an outflow of participants, and the pre-crisis rising trend has not recovered.

With regard to gender differences, unlike Romania, first, the growth rate at the beginning and the rate of decline at the end is greater in men than in women; secondly, the amplitude of cyclical fluctuations of male time series is greater; but in time, the significant peaks and troughs usually coincide (as well as in Romania). Thus, in the time series of women four troughs Q1-11, Q2-12, Q2-14, Q1-16 was identified (quasi-cycles are equal to 5, 7 or 8 quarters); and in the time series of the men five troughs Q1-11, Q1-12, Q2-13, Q2-14, Q1-16 (quasi-cycles are equal to 4, 5, 7 quarters). It is noteworthy that in Ukraine, unlike Romania, the calendar anomaly is manifested by the effect (Q1/Q2-trough) of the beginning of the year.

Table 1 shows the results of estimating the cyclical persistence and volatility of time series of participants' growth rates; a comparison of estimates with the visually identified gender differences shows good agreement. All correlation coefficients  $r_1$  are insignificant at  $\alpha \leq 0.05$ , thus cyclical fluctuations of all time series are antipersistent; but "slightly more persistent" were the cycles of growth rates of male participants, both in Romania and in Ukraine. In Romania, absolute and relative cyclical volatility of the growth rates of female participants are greater than that of male participants, and in Ukraine, on the contrary; but in Romania, the gender gap is 1.6%, and in Ukraine is 32.3%. This result contradicts the hypothesis H4, we will further refine it using a more reliable mathematical toolkit. The relative cyclical volatility of all time series is less than 1, which means that the amplitude of fluctuations in

pension behavior of men and women both in Romania and Ukraine is less than the amplitude of fluctuations in national business cycles.

For all series, the hypothesis  $H_0: \rho(0) = 0$  was confirmed, thus all behavior patterns are acyclic, and the participants' growth rates have no relation to the health of the economy in both Romania and Ukraine. The values of the cross-correlation coefficients  $\rho(k)$  ( $k = 1, 2, 3, 4$ ) are also statistically insignificant at a given significance level of 0.05, so synchronism with business cycles could not be established. Thus, we reject the hypothesis H2 that economic fluctuations affect behavior patterns, and the level of influence depends on gender.

Table 1. Cyclical analysis of time series of participants' growth rates

Country	Gender	Aggregation level	Cyclical persistence	Absolute cyclical volatility	Relative cyclical volatility	Relation to the economy
Romania	Men	quarterly	0.2023	0.6997	0.5885	acyclic
	Women	quarterly	0.0289	0.7114	0.5984	acyclic
	Total	quarterly	0.1409	0.6459	0.5433	acyclic
Ukraine	Men	quarterly	-0.1150	8.5248	0.4923	acyclic
	Women	quarterly	-0.1014	6.4479	0.3723	acyclic
	Total	quarterly	-0.1110	7.5823	0.4378	acyclic

Source: Author's calculations based on Financial Supervisory Authority (2018), National Commission for Regulation of Financial Services Markets (2018), National Institute of Statistics (2018), and State Statistics Service of Ukraine (2018)

In order to test the H3 hypothesis about the fractal nature of behavior patterns, and also to strictly identify the cycles and memory depth, we apply Rescaled Range Analysis (R/S-analysis). It should be noted some features of the application of R/S-analysis to identify and compare the gender gap in pension behavior. First, we used the same time interval and aggregation level (for comparison by country). But since the history of private pension provision is short, we have short time series; this can lead to a bias of the estimates of fractal analysis. Secondly, the pension time series were normalized to have a mean of 100% and a unit variance. Thirdly, to calculate the values of  $R/S(n)$ , we used the Peters approach (Peters 1994), that is, we used the values of  $n$ , which are dividers of the total number of observations. Thus, all R/S-values use all the data, but the number of quarterly data was reduced to 30, and the monthly data to 100. Therefore, we first processed the first 30 (100) data, then the last; this is because the R/S-analysis should not be sensitive to the starting point if there is enough data.

Table 2 shows that all values of the Hurst exponent  $H < 0.5$  (values of the adjusted multiple coefficient of determination ( $Adj. R^2$ ) and p-values indicate a good fit of all Hurst regressions and the statistical significance of all estimates of the Hurst exponents). This means that the behavior of both men and women, both in Romania and in Ukraine, is an anti-persistent behavior with short-term memory. The graphs of the cyclical components in Figure 1 confirm that with fractional noise at  $H < 0.5$  large positive deviations are accompanied by large negative deviations and vice versa. At the same time, there are some differences.

Table 2. Rescaled range analysis of time series of participants' growth rates

Country	Gender	Aggregation level	Hurst exponent	P-value	Avg. $R^2$	Fractal dimension	Fractional noise
Romania	Men	monthly	0.4020	0.0004	0.9582	1.5980	white
	Women	monthly	0.4106	0.00001	0.9939	1.5894	white
	Total	monthly	0.3363	0.0005	0.9532	1.6637	pink
	Men	quarterly	0.4635	0.0004	0.9862	1.5365	white
	Women	quarterly	0.3629	0.0359	0.7532	1.6371	pink
	Total	quarterly	0.3320	0.0102	0.8905	1.6680	pink
Ukraine	Men	quarterly	0.4259	0.0003	0.9904	1.5741	white
	Women	quarterly	0.4853	0.0002	0.9924	1.5147	white
	Total	quarterly	0.4598	0.00003	0.9978	1.5402	white

Source: Author's calculations based on Financial Supervisory Authority (2018) and National Commission for Regulation of Financial Services Markets (2018)

Monthly aggregation produced Hurst exponent estimates at the lower boundary of the white noise range ( $H_m = 0.40$  for males and  $H_w = 0.41$  for females), but the overall behavior is already in the pink noise range ( $H_t = 0.34$ ); the gender gap is not statistically significant. To compare pension behavior by gender and countries, we use quarterly aggregation. In this case, there is a significant difference in the behavior of men and women in Romania ( $H_m = 0.46$  and  $H_w = 0.36$ ). The more unstable (pink noise) is the behavior of women, the length of their memory and cycles is shorter. In Ukraine, the gender gap in pension behavior is less pronounced and reverse

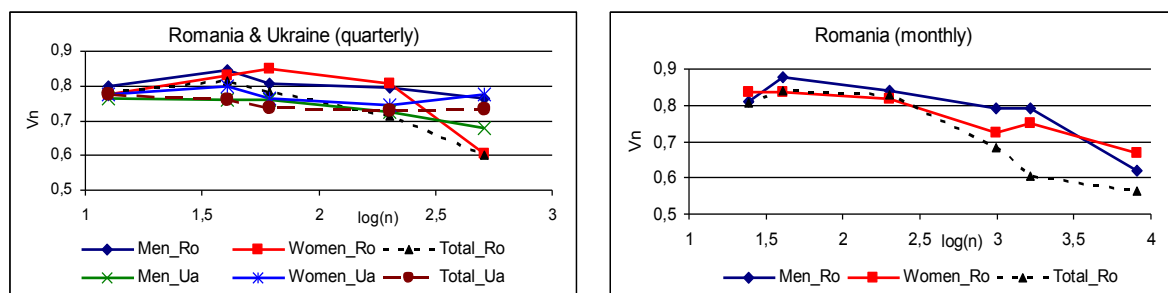


( $H_m = 0.43$  and  $H_w = 0.49$ ). Thus, using Hurst exponent estimates, we can conclude that the gender gap in pension behavior is 27.7% in Romania and -12.2% in Ukraine. Why is there a larger gender gap in Romania? The answer to this question is as follows. Pension behavior depends on the ability to plan voluntary retirement savings and assess long-term risks, *i.e.* depends on financial literacy. In this sense, our result correlates with the conclusion of Lusardi and Mitchell (2011) that "in Russia and for residents of East Germany, there are no sex differences in financial knowledge—and both women and men are equally financial illiterate". At the same time, a comparison of East and West Germans showed: (i) West Germans are the most financially literate; (ii) financial literacy in the West is much lower for women than for men. Hence, we can conclude that in the Western countries the gender gap is greater than in Eastern Europe. Hence, we can conclude that in the Western countries the gender gap is greater than in Eastern Europe.

In our case, the difference is not very large, since both countries have a common socialist past, but in Romania it was "shorter", and Romania more quickly integrated into the European Union, and this is reflected in behavioral patterns. The Hurst exponent estimates for total pension behavior in Romania and Ukraine ( $H_{ro} = 0.33$  and  $H_{ua} = 0.46$ ) lead to mixed conclusions. In Romania, Hurst exponent is closer to zero, so the volatility of pension behavior is more pronounced and, accordingly, the risk of a private pension system is higher. In Ukraine, a large  $H$  value shows less "noise", and points to a more pronounced fractal nature. This means that the risk of a large deviation (black swan) is much higher than implies a normal distribution (as was the case in the past, see Figure 1). At the same time, these jumps and a following drop in the growth of participants are explained by the fact that employers periodically use the policy of "nudge" (and, perhaps, even stronger techniques), *i.e.* the process of joining professional and corporate pension funds is a partially controlled process. Accordingly, the gender gap in employment in industry explains the larger jumps in the growth of men. In addition, the gender gap in the labor market is the reason for the gender gap in the coverage of voluntary pension provision. In Ukraine, the total coverage is 2.31% of the population over the age of 15, the coverage of men is 2.97%, and the coverage of women is 1.76%; while in Romania, the total coverage is 2.74%, the coverage of men is 2.80%, and the coverage of women is 2.69%. Thus, our data support the findings of Even and Macpherson (1994) that, due to the development of the labor market, its characteristics for men and women converge, and as a result, the gender gap in coverage is reducing.

The values of the Hurst exponent in the Table 2 show that there is no long-term memory in all series, but to clarify, we calculated and analyzed the  $V$ -statistics for all pension time series. The  $\log(n) - V_n$  plots for quarterly aggregation (see Figure 2) show that the "breakdown" of the trend occurs at the second or third points, that is, the estimated memory length is approximately the same for all and is equal to 5-7 quarters. As for the monthly aggregation for Romania, the first local maximum of the  $V$ -statistics of the time series of men is the second point, and the second local maximum is the fifth point; for the time series of women, the local maximum at the fifth point (although the second point is not the maximum, but after it the trend begins to decline). This means that the estimated length of the memory of men is 5 months and 25 months (or 6.25 quarters), and women—25 months. The question arises: why is the motion of  $V$ -statistics fundamentally different for approximately equal values of the Hurst exponent? We will try to find the answer by using the phase analysis.

Figure 2.  $V$ -statistics related to time series of participants' growth rates (quarterly and monthly aggregation)

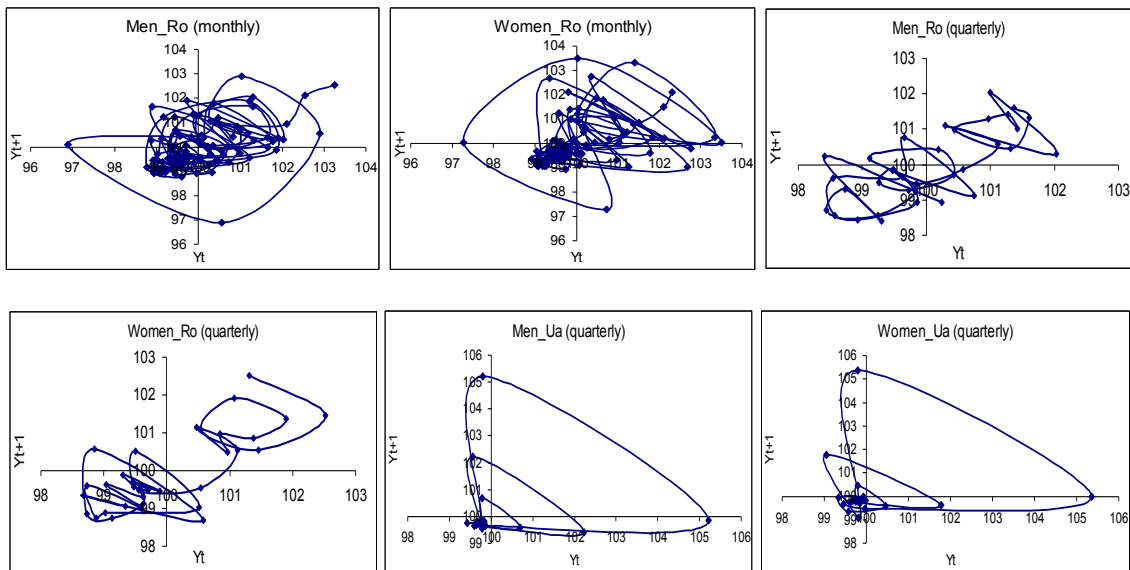


Source: Author's elaboration

Figure 3 illustrates the phase portraits of time series of participants' growth rates in Romanian and Ukrainian voluntary pension systems separately for men and women and for quarterly and monthly aggregation. The phase portraits reflect significant differences between countries and insignificant gender differences within each country. Nevertheless, the cycling of the time series of men is more persistent than that of women (especially in Romania). These conclusions are consistent with estimates of the persistence of time series of cyclical components (see Table 1) and fractal characteristics (see Table 2).



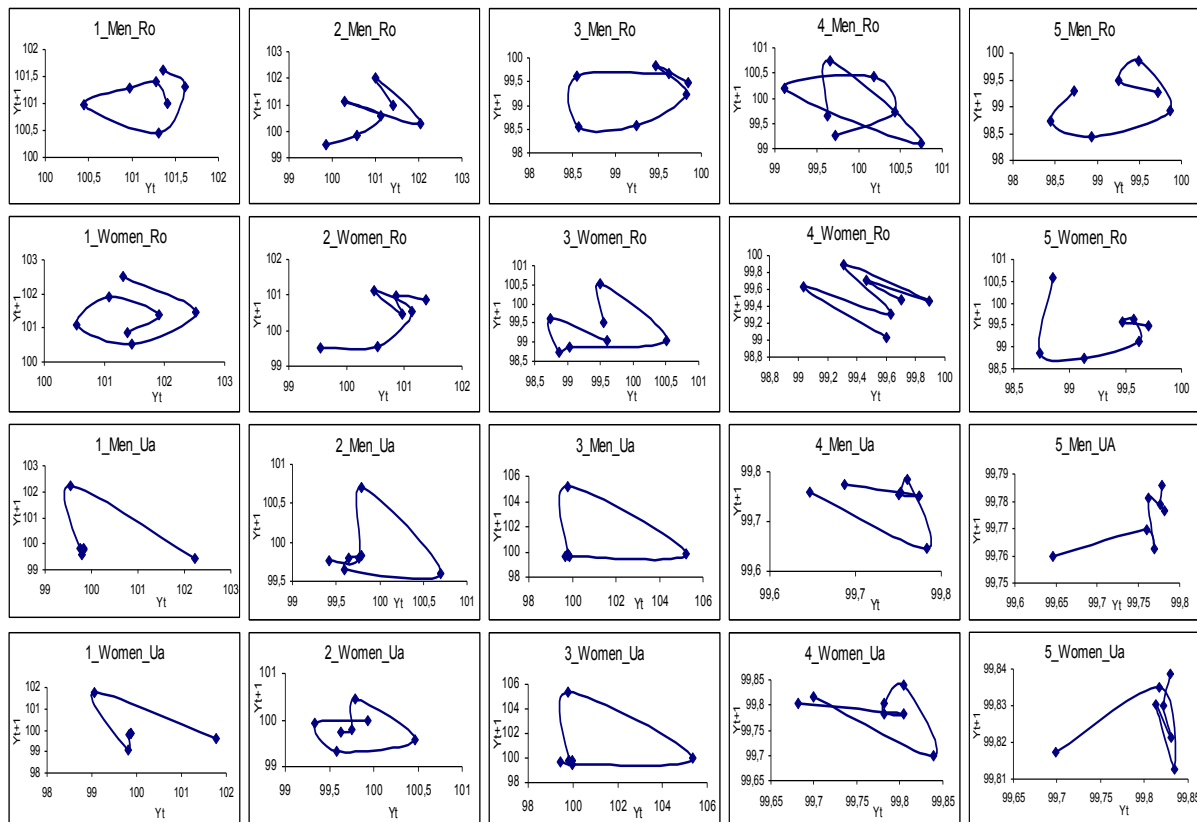
Figure 3. Phase portraits of time series of participants' growth rates (quarterly and monthly aggregation)



Source: Author's elaboration based on Financial Supervisory Authority (2018) and National Commission for Regulation of Financial Services Markets (2018)

The decomposition of phase portraits (quarterly aggregation) into quasi-cycles showed that for all pension time series, the greatest number of completed quasi-cycles with a length of seven quarters is observed. Figure 4 shows that for Romania, the time series of the growth rate of men actually consists of four seven-quarter completed quasi-cycles, and women—of two quasi-cycles; for Ukraine, both time series consist of three seven-quarter quasi-cycles, and the forms of quasi-cycles are almost identical.

Figure 4. Decomposition of the phase portraits into quasi-cycles (quarterly aggregation)



Source: Author's elaboration based on Financial Supervisory Authority (2018) and National Commission for Regulation of Financial Services Markets (2018)

This again confirms the hypothesis that gender differences in behavior patterns increase as financial and stock markets develop, as the gender gap in financial knowledge increases. It should be further noted the following, the Hurst exponent value for women in Ukraine is higher than for the men of Romania (see Table 2); but since the difference is insignificant, it was expressed in a more qualitative form, but in fewer quasi-cycles of time series of Ukrainian women.

As for the monthly aggregation for Romania, the decomposition of phase portraits into quasi-cycles gave the following results: (i) the time series of men has 13 completed five-month quasi-cycles (out of 21 possible); (ii) in the time series of women there are only 7 such quasi-cycles; (iii) for both women and men, completed quasi-cycles 25 months long are two out of four and all of them are self-intersecting. The result obtained illustrates the approximate equality of the Hurst exponents.

## Conclusion

The main purpose of this study was to test four hypotheses about behavior patterns regarding membership in voluntary pension systems. Nevertheless, when we investigated these hypotheses using data from Romania and Ukraine, not all of them were confirmed. Cyclical analysis of time series using the Hodrick-Prescott filter: (i) long-term trends differ in the rate of growth, but significant gender differences were not found in the forms of the curves in both Romania and Ukraine; (ii) cyclical fluctuations of all time series are antipersistent, but in both countries "slightly more persistent" were the cycles of growth rates of male participants; at the same time, in Ukraine, unlike Romania, the cyclical volatility of the growth rates of male participants is significantly larger than female participants (we explain this paradox using the policy of "nudge" and the gender gap in employment in industry); (iii) hypothesis H2 was not confirmed for both countries at a given significance level of 0.05. To test hypothesis H3, R/S-analysis was used; Hurst exponent estimates for all series are less than 0.5 (p-values <0.05), *i.e.* the behavior of men and women in both countries is an anti-persistent behavior with short-term memory; the gender gaps in Hurst exponent estimates are 27.7% in Romania and -12.2% in Ukraine. Using fractal and phase analysis, we confirmed the H4 hypothesis that gender differences in behavior patterns increase as financial and stock markets develop, as the gender gap in financial knowledge increases. On the other hand, the gender gap in the coverage of the population by voluntary pension provision is declining as the characteristics of the male and female labor markets converge.

Since in this study not all issues of gender differences are considered, the future research directions are as follows. First, hypothesis testing based on data from two countries is probably not sufficient, so future studies need to use data from other countries. Secondly, it is necessary to identify and compare factors that affect gender differences in behavior patterns in these countries. Thirdly, it is necessary to identify whether there is a gender gap in pension contributions and with what factors it correlates. The results of these studies will be most useful to pension policy makers.

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## The Impact of Advertising on Micro-Enterprises in Baja California, Mexico

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### Abstract:

The objective of this research was to examine the effect of advertising on the performance of 1,478 micro-enterprises in Baja California. From the combination of statistical techniques of univariate and multivariate analysis, we studied the relationship that advertising activities have with factors related to educational level, age, and experience of the business owner, size of the company and seniority in the market. In the same way, it was evaluated if the performance of these economic units is related to the advertising channels used to publicize the products and/or services. The main findings suggest that as schooling and experience increase, while the owner's age decreases, the likelihood of micro-enterprises doing some type of advertising increases. Likewise, it was found that when the number of workers increases and the companies are of recent foundation, there is a greater probability of using advertising as part of their management strategy. The results confirm that the micro-enterprises that promote their products and services through social networks and the internet perform better than those that use other advertising channels.

**Keywords:** advertising; micro-enterprises; Mexico

**JEL Classification:** M30; M37

### Introduction

The current global environments, the growing and changing needs of customers and consumers are undoubtedly the main concerns of businessmen, who main concern is to generate competitive advantages that allow them to face the challenges of their environment. Given these scenarios, micro-enterprises face an even greater challenge due to the limitations and shortcomings that characterize them, hence the need to implement strategies that allow them to grow and remain in the markets. In this context, offering innovative products and services that meet the demands are accompanied by the use of advertising mechanisms that contribute to the positioning and expansion of the business. The success of its sales is directly related to the media used to inform and interact with its consumers, leaving advertising as the optimal marketing tool to achieve it.

The technological pace has brought with it the emergence of various forms or mechanisms to exercise publicity, based primarily on the use of the Internet due to the benefits it provides: such as cost reduction, elimination of barriers, but above all, the ability to increase sales thanks to its global reach. These spaces provide micro-enterprises with the opportunity to have a greater presence in social networks, which, together with an attractive language for consumers, can generate positive impacts on the business in a shorter time, without necessarily incurring in high advertising costs.

### 1. Literature Review

In the review of the literature, an evolution is observed in relation to the ways in which companies have carried out advertising throughout history. In the beginning, the main advertising media were posters, brochures and newspapers. Later on, from the War of Succession to the First World War, there were very notable changes in the markets and therefore also in the advertising practice. The evolution of the economy and the technological

advances stimulated radical changes in the creation of brands, the media and advertising agencies (Tellis and Redondo 2002).

Today, companies are being forced to adopt new marketing strategies as technology advances, and customer preferences threaten to make traditional forms of promotion obsolete. In this transition, modern marketing has replaced the term promotion with the concept of integrated marketing communications (IMC), which is the coordination of all promotional activities, including media advertising, direct mail, sales promotion, website design, among others; with the purpose of creating a consistent message through multiple channels to ensure a persuasive impact on current and potential customers of the company (Ferrell and Hartline 2017).

In this way advertising nowadays becomes the transmission of impersonal and remunerated information, which organizations carry out through the media, whether traditional or digital, and directed to a definite public with the objective of stimulating the demand for a product or service (Monferrer 2013). At the same time, advertising can be used in the re-engineering of a brand with the purpose of changing the opinion of its current and potential customers, and can even be used to influence consumer behavior, which is achieved due to the constant exposure that consumers have with the brands, logos, slogans and products of a company. However, for advertising to have an impact on the positioning of companies and their participation in the market it is necessary to properly select and manage the different existing communication media.

In this sense, the media are considered as instruments and/or tools used by organizations to inform, remind, communicate and persuade their target markets. According to Lamb, Hair, and McDaniel (2017) these are classified according to their physical structure in: audiovisual (Television, Cinema), radio (Radio), printed (journals, newspapers, magazines, brochures, pamphlets) and digital (social networks, institutional websites, email, mobile applications). It is worth noting that despite the fact that television is the one with the highest public index worldwide, digital media have shown a rebound and acceptance by the markets, modifying the traditional ways of advertising.

The statistics highlight that, in relation to social networks and platforms, Facebook ranks number one in the preference of users, followed by YouTube and WhatsApp. According to the study carried out by the company We are Social and Hootsuite (2018), Facebook has 2,167 million active users in a month, and 95.1% of users access this type of social networks through mobile devices, mainly cell phones and tablets, which makes this popular medium so easy to access. On the other hand, 70% of consumers prefer to know about their products and promotions directly from social networks, official sites, blogs and even YouTube videos.

The use of the Internet and social networks has created new opportunities for companies, especially for the smallest ones, by generating spaces where it is possible to know the habits and interests of final consumers by personalizing the service and the products offered. This technological evolution has been accompanied by the implementation of modern marketing strategies and personalized advertising such as micromarketing, one-to-one marketing and digital marketing. Micromarketing as a segmentation strategy seeks to satisfy the needs of a specific market niche, defined mainly by its geographical location and its demographic peculiarities. This strategy is characterized by offering products and services through specific methods for each type of customer, which has allowed marketing "one to one" to rebound with ease. In accordance, the "one to one" aims to increase the participation of current customers, in addition to ensuring long-term relationships with them, so that the treatment is individual, unique and personalized (Lamb, Hair, and McDaniel 2017).

For its part, digital marketing has become the advertising that drives the current strategies of managing and practicing marketing. In accordance with Ferrell and Hartline (2017), it is defined as all advertising that communicates the promotions of the products or brands that companies own through electronic means. Digital marketing implies the construction of web pages oriented to sales, email marketing, search engine optimization, newsletters and promotion in social media. Its objective is to increase the traffic of potential customers to the web pages created, and at the same time, it aims to convert that traffic into customers, build loyalty and convert them into prescribers. To achieve the impact of traffic that is expected, digital marketing has tools such as emailing, search engine optimization, affiliate marketing, influence marketing, buzz marketing and paid advertising.

In this context, promotion in social media, as part of digital marketing, has a number of typologies that facilitate communication and interaction with consumers, such as: horizontal social networks aimed at a generic audience focused on contacts (Facebook), vertical social networks with a tendency toward specialization, professional networks focused on business and commercial activities, cultural identity networks, social networks of hobbies aimed at lovers of some leisure activity and free time, and content platforms where its members share various content such as videos, photographs or news. The combination of these practices allows a direct connection with the target audience, so, in this sense, digital marketing participates as a complement to traditional advertising actions (Alcaide *et al.* 2013).



Although there is currently a wide range of means to promote products and/or services so that online advertising or through electronic means becomes effective, it is necessary to have an appropriate content strategy, which consists of planning, designing and implementation of the website or digital medium. Similarly, it is essential to select the appropriate means, create effective announcements, but, above all, design attractive messages that allow entrepreneurs to position their brand, as well as identify a competitive advantage to cope with the constant changes in the environment. To achieve this objective, companies need to develop strategies that generate value, that are not executed simultaneously by any current or potential competitor, and that are sustainable, difficult to imitate and not substitutable (Olson, Slater, Hurt, Tomas and Olson 2018).

Empirical research on advertising strategies in the business context focus more on large companies and multinational companies. This concentration aimed at companies with global reach may be associated with the argument that some authors hold, which states that only large companies can enter the market due to the abundant publicity needed to compete and where only those with financial resources could consider to implement it (Tellis and Redondo 2002). In this sense, the studies have been aimed at evaluating different relationships, such as the effect of investment in advertising and the return on capital, the influence of advertising spent on market share, the relationship between sales and advertising, as well as the presence of economies or diseconomies of advertising scale from the obtaining of increasing or decreasing advertising returns. In the field of micro-enterprises, even though the empirical evidence is not abundant, there is some research that has shown that the use of advertising and the implementation of marketing strategies now play a fundamental role in the success of these companies. Some evidence at the international level is presented in countries such as India, Australia, Kenya, Jordan and Malaysia (Tivedi 2013, Mathews, Bianchi, Perks, and Healy 2016, Njau and Karugu 2014, Allahawiah, Altarawneh and Alamro 2010, Syed Shah Alam *et al.* 2005). In this sense, the main objectives of the analysis have been focused on evaluating the impact and relationship between the implementation of marketing tools such as Internet advertising, e-commerce and "one to one" marketing regarding the company's performance, either through sales or market share. The results obtained show that the use of search engine marketing, email marketing, and blog marketing influences the performance of this type of company. This is because, in the case of the market of self-service stores, there is heterogeneity in the type of advertising scales, obtaining different returns in the group of companies that belong to the branch, while in the sector of producing goods of convenience the result is homogeneous.

In the same way, it is established that the use of the internet as an advertising management strategy contributes to attracting new customers, promotes the commercialization of its products and therefore achieves an increase in sales and a better performance. In addition, empirical evidence has confirmed that online advertising allows direct and rapid communication with consumers, where social networks stand out as the best form of unpaid advertising that directly impacts the market coverage and profitability of these businesses. It is also pointed out that the effectiveness of online sales depends on Internet connectivity, therefore, it is necessary to previously have an Internet service provider that offers the stable technical support necessary to provide timely responses to current and potential customers, otherwise it will only reduce the reliability of the sales system and will directly damage the image of the company.

In the case of Mexico, the authors Sánchez, Vázquez and Mejía (2017) demonstrated the presence of a positive correlation between the key factors of marketing, related to strategic planning, knowledge and marketing strategies, and the level of competitiveness, in a sample of 380 micro-enterprises belonging to the commerce sector of the city of Guadalajara. Among the main results, it was found that the largest percentage of these companies carry out advertising using traditional media, where formats as flyers, magazines, diptychs and, to a lesser extent, digital advertising through web pages stand out. These findings in particular highlight the presence of some skepticism on the part of those who direct these businesses when it comes to the adoption of more modern advertising strategies.

Authors such as Zumba, Torres and Aguilar (2016) argue that managers of these companies have limited experience in the use of digital media, which affects the perception of the benefits they provide. In accordance with this approach, there are theories that establish a relationship of dependence between the performance and the evolution of the business regarding the behavior and characteristics of the owner. Within these notions, it's found the theory of the high commands, which states that the growth of companies, as well as its survival, rests on the figure of the owner and depends on various factors such as skills, values, experiences, aspirations, interests, individual objectives, educational level, age and risk aversion of the business owner (Cannella, Finkelstein and Hambrick 2009, Hambrick and Mason 1984). Within this group of factors, the educational level, experience, and age are fundamental elements in the implementation of management strategies.

The analysis of these variables in the context of micro-enterprises is a key element to understand the operation of this type of business since the responsibility to administer the resources rests with the owner and it is he who at the end makes the decisions and establishes the mechanisms and the ways to carry out business management. Consequently, it is vital to have the knowledge necessary for the company to develop and be successful, which is achieved through the implementation of techniques, tools, and capabilities that are acquired through the training they achieve throughout their lifetime. In the same way, the accumulated experience on the part of the owner, not only as the proprietor of the business, but also in his career, plays a crucial role in overcoming problems (Nofsinger and Wang 2011). That is, in the presence of difficulties that may arise in the management and execution of activities, the business administration can be more successful when the micro-entrepreneur has worked for an extended period of time. Accordingly, the higher the level of schooling and the more experience he has, the better he will be able to implement the acquired competencies and make effective decisions.

At the same time, the age of the micro-entrepreneur is very much related to the skills and abilities needed in the current business environment, as advances in digital media must be accompanied by a positive willingness to change, so that the company can adapt to the new demands of consumers. In this sense, young entrepreneurs are in more advantageous positions because they were trained in the digital age and their interaction and establishment of relationships through these mechanisms are easier, while older owners may manifest a certain aversion to modify their traditional forms of management.

In the same way that individual factors associated with the owner affect the implementation of advertising strategies, there are other variables connected with the characteristics of the companies, which are linked to the theories of business growth. Authors such as Morales *et al.* (2017) and Aguilera and Virgen (2014) state that the growth decision can be made internally from indicators such as sales, utility, installed capacity, among others. They also affirm that the determinants of business growth can be associated with the size and age of the company. In this sense, empirical studies (Cruz 2014) have shown a positive relationship between the size of the company and the advertising implemented. The arguments establish the presence of a direct impact of the size of the company on the magnitude of its advertising campaign, with some advantage for the larger ones, because these are better prepared to sustain large promotions.

Conversely, the expected relationship between age and advertising is reversed, because the time that microenterprises have been operating will affect the need to implement more or less publicity to attain market objectives. Given these scenarios, to accomplish sustainable growth and a competitive position they must be constantly oriented to identify approaches and strategies for market positioning according to the needs and demands of consumers (Petkovska *et al.* 2017).

## 2. Methodology

In accordance with the objective of the study, a quantitative research was developed in which is combined the descriptive and the correlational approach. The total analysis universe is made up of a total of 38,000 microenterprises from the city of Tijuana, Baja California registered in the database of the National Directory of Economic Units (DENUE). For the determination of the sample size, a margin of error of 2.5% and a confidence level of 95% was established, which yielded a total sample of 1,478 micro-businesses. The design of the fieldwork was carried out through a stratified random sampling according to the different sectors of economic activity defined by the National Institute of Statistics and Geography of Mexico. In this way, 475 companies in the service sector were studied, 477 from the commercial sector, 339 from the manufacturing sector and 193 from the construction sector. The information was collected between the months of August and November of 2017 through a survey specifically addressed to the managers of these companies.

To corroborate the first objective of the research and with the purpose of exploring the characteristics of companies that use advertising in relation to those that do not, the multivariate statistical technique of discriminant analysis was applied. The purpose of this methodology is to estimate a function in which independent variables of a quantitative nature and a dependent variable take part, which assumes as many discrete values as the number of  $k$  groups that are being analyzed (Varela, Castillo, and Ocegueda 2013). In this way, and given that the purpose of the study is to explore how the interest groups differ, a linear combination is obtained that adopts the following form:

$$D_{jk} = a + W_1X_{1k} + W_2X_{2k} + W_3X_{3k} + \dots + W_nX_{nk} \quad (1)$$

where:  $D_{jk}$ : Discriminant score of function  $j$  for group  $k$ ;  $a$ : Constant;  $W_i$ : Discriminant weight for the independent variable  $i$ ;  $X_{ik}$ : Independent variable  $i$  associated with group  $k$ .

The dependent variable was defined in two categories, the first associated with companies that have used some type of advertising, and the second referred to those that have not. As independent variables, factors associated with the characteristics of the company are analyzed, such as the number of employees and the time they have been operating in the market. Likewise, variables associated with the owner of the business are evaluated, such as age, experience and educational level.

For the estimation of the discriminant function, the direct method was used, which allows the independent variables to be included in the analysis simultaneously. After that, the predictive reliability is evaluated by calculating the discriminant score (D) for each company, as well as estimating the cutoff point that helps determine if a company belongs to one group or another. The optimal cutoff point will depend on whether the size of the groups is similar or not; and whenever standardized data are used, the cutoff point will be zero. Derived from the estimation of the model, the centroids of the k-groups are calculated according to the following expressions:

$$C_a = \mu_1 X_{1I} + \mu_2 X_{2I} + \dots + \mu_k X_{kI} \quad (2)$$

$$C_b = \mu_1 X_{1II} + \mu_2 X_{2II} + \dots + \mu_k X_{kII} \quad (3)$$

Where the discriminating cutoff point would be equal to:

$$P_0 = \frac{C_a + C_b}{2} \quad (4)$$

Being  $P_0$  the optimal cutoff point,  $C_a$  centroid of the A group, and  $C_b$  the centroid of B group. The criterion used for the classification of groups is as follows: if  $C_i < P_0$  the company  $i$  is classified in group A, which in this case is associated with companies that have made some kind of advertising, and if  $C_i > P_0$  then it belongs to group B, which groups companies that do not advertise.

To validate the fit of the model, the Wilks's lambda statistic value is used in its version transformed by Barlett (1947), where is submitted to statistical test the null hypothesis that in the population the means of all the discriminant functions are equal in all the groups. In this transformation, the statistic value is approximated to the chi-square distribution with  $(p-k)(g-k-1)$  degrees of freedom, where  $p$  is the number of independent variables,  $g$  is the number of groups and  $k$  is the number of discriminant functions obtained. Under this approach, when Wilks's lambda is significant ( $< 0.05$ ), the null hypothesis is rejected, so that the results can be interpreted. The matrix of correct answers is also used, in which a comparison is made between the ratios of correct answers with the percentage of well classified cases that would be obtained if the classification were random. It is considered that for the analysis of two groups this percentage must be higher than 50% (Trespacios, Vazquez and Bello 2005). Likewise, the Box test is applied and the hypothesis that the population covariance matrices of both groups are equal is contrasted.

To validate the second objective of the research, the combination of two nonparametric tests, the Mann-Whitney  $U$  test ( $U$ ) and the Kruskal-Wallis test ( $H$ ) are used. The Mann-Whitney  $U$  test is a statistical method that allows analyzing differences between a continuous variable, in this case, the monthly value of sales, against a nominal variable of two categories, the first associated with companies that perform some type of advertising and the second referred to those that do not use it. The null hypothesis refers to the fact that the medians of the population from which both samples come are the same. It is further assumed that the sample data are randomized from two independent observation groups and the distribution of the population of the dependent variable for the two group shares a similar unspecified form, albeit with possibilities of differences in the central tendency measures. To calculate the  $U$  statistic value, the following expression is used:

$$U = n_1 n_2 + \frac{n_2 (n_2 + 1)}{2} + \sum_{i=n_1+1}^{n_2} R_i \quad (5)$$

where:  $n_1$  = size of sample 1,  $n_2$  size of sample 2,  $R_i$  = scope of sample  $i$

Taking into account the above, the following research hypothesis is defined:

H0: There are no significant differences in the value of the sales of the micro-enterprises that carry out advertising and those that do not.

The Kruskal-Wallis test is used to evaluate possible differences in the performance of the companies associated with the advertising channel they use. Similar to the Mann-Whitney  $U$  test, the Kruskal-Wallis test evaluates differences in a continuous variable against a nominal variable when it has three or more categories. In this case, the continuous variable corresponds to the monthly value of sales, and the nominal variable has 7 categories that identify the different advertising channels used by micro-enterprises to promote their products and

services. In this case the following are analyzed: business cards, billboards, flyers, social networks, Internet, radio and television.

For the calculation of the testing statistic value, the  $n$  observations are ordered from lowest to highest and the ranges are assigned from 1 to  $n$ . Once this step is concluded, the sums obtained from each of the groups are compared by means of a statistical value of contrast, evaluating their value respecting the chi-square distribution law with  $k-1$ . The statistical test value  $H$  is calculated as follows:

$$H = \frac{12}{N(N-1)} \sum_{i=1}^k \frac{R_i^2}{n_i} - 3(N+1) \quad (6)$$

where:  $n_i$  ( $i = 1, 2, \dots, k$ ) = size of each of the samples for the  $k$  group of data,  $R_i$  = the sum of the ranks of group  $i$ ;  $N$  = total number of observations in all samples.

If the null hypothesis is true, it is expected that the average range is approximately equal for the  $k$  samples; on the contrary, when the averages are very different, it is an indication that there are differences between the groups. According to these arguments, the second research hypothesis was defined like this:

H0: There are no significant differences in the sales values of the micro-enterprises and the advertising channels they use.

### 3. Results

To begin with the discussion of the results, the descriptive analysis of the variables used in the study is presented. In this sense, and according to the statistics obtained, the highest percentage of companies (73%) are headed by men, the average age of the owners of these businesses is 45 years, with a previous experience in the labor market of 14 years. In terms of educational level, 3.7% of the sample has no schooling, 13.3% has a primary level, 25% completed secondary education, 30.1% high school, 22.8% has a bachelor's degree and the remaining 5.1% has a graduate level.

In relation to the variables related to the characteristics of the company, it was found that on average these economic units have 7 workers and have about 13 years operating in the market. In terms of sales, 7.4% of the sample has incomes lower than 5,000 Mexican pesos per month, 28.5% between 5,000 and 10,000 Mexican pesos and 64.1% receives incomes higher than 10,000 Mexican pesos per month. Of the 1,478 companies analyzed, 61% use some type of advertising, unlike 39% that do not incorporate it as part of their management strategy. According to the descriptive statistics values, the main means by which these companies carry out advertising are business cards (36%) and outdoor advertising (30.4%).

According to Table 1, the worth of the testing statistic value Wilks' s Lambda is lower than 0.05, which allows us to affirm that there are significant differences in the population means of the groups analyzed in the discriminant function. The Box's M statistic value obtained is 210,471 with a level of significance of 0.00, which allows rejecting the hypothesis of equality of matrices of variances-covariances. On the other hand, in the success matrix, the estimated value reflects that 64.5% of the original grouped cases were classified correctly, so it is considered an acceptable value for the discriminant analysis and statistically validates the results. Taking into account the previous statistics values, the analysis of the Goodness of fit indicates that the used variables explain the group differences jointly.

Table 1. Goodness of fit statistics values

Wilks' s lambda	Chi-square	Sig.
.878	192.366	.000
Box's M	F approx.	Sig.
210.471	13.977	.000

Source: Own elaboration.

In the examination of the tests of equality of means shown in Table 2, the F statistic value indicates that at the individual level only schooling, age, and number of workers distinguish in a significant way the companies that carry out advertising from those that don't do it, in this case, work experience and time in the market were not statistically significant.

Table 2. Discriminant analysis statistic value

Variable	F univariate	Standardized coefficients Canonical function	Structure matrix
Level of education	183.68*	0.906	0.945
Work experience	0.051	0.237	0.016
Age	11.79*	-0.217	-0.239
Time in the market	0.175	-0.134	0.029
Number of workers	26.89*	0.256	0.361

Note: \* significant at 5%

Source: Own elaboration.

The estimation of the centroids of the discriminant function reflects that for the first group of analysis, in this case the companies that perform some type of advertising, it has a positive value ( $C_a = 0.300$ ), while for the second group the value is negative  $C_b = -.464$ . According to the standardized coefficients of the canonical function shown in Table 2, these values suggest that as the level of education and experience increases, and the age of the business owner decreases, the probability of microenterprises performing some type of advertising rises. Likewise, it is observed that the level of education is the variable that has the greatest power of discrimination between the two groups, with a value of 0.906, and is, in turn, the one that has the highest level of correlation with the standardized discriminant function (0.945). These results reveal the importance of the level of education in the population, because it is a variable that has an impact not only the workplace, but also in the development of business and economic sectors in the region. The knowledge, skills, and abilities acquired during the transit through the education system forge them to face a competitive market, where the adoption of innovative strategies allows them to grow and to obtain greater benefits.

In the same way, the statistical values confirm that as the number of workers and micro-enterprises increases, they have a lower probability of using advertising as part of their business management strategy. This behavior is explained based on the purposes pursued by the advertising campaigns, which are carried out according to the objective that propels the company, which may be to inform, persuade or remind of something. In this sense, micro-enterprises that have been operating for less time need to publicize their product and make it attractive, as well as break the inertia and incite a change in the consumers, who must be driven to change, which is why the intensity of their advertising campaign will be greater compared to those that have been around more time. At the same time, the increase in the number of workers is a reflection of an expansion of the business that must be accompanied by strategies that have the capacity to retain their consumers and manage to increase their market share, so there is a greater probability that these companies deploy a much larger advertising campaign than those that do not grow.

Table 3 shows the results of the test of differences between the variable monthly value of sales and the nominal variable use of advertising. According to the statistical value U of Mann-Whitney, significant differences are observed between both groups ( $<0.05$ ). In this way, and in accordance with the values of the average ranges, it can be affirmed that the companies that carry out some type of advertising have higher sales levels, which leads to rejecting the first research hypothesis.

Table 3. Results of the Mann-Whitney U test monthly value of sales - use of advertising

Statistic Value Mann-Whitney U	Value	Asymptotic Significance (bilateral)	Average range	
			Uses advertising	Doesn't uses advertising
	203,306	.000*	803.1	641.03

Note: \* significant at 5%

Source: Own elaboration.

In relation to hypothesis number two and according to the results of the Kruskal-Wallis test, the statistical values confirm that there are significant differences between the monthly value of sales and the different advertising channels used by micro-enterprises. As can be seen in the average ranges, the greatest benefits are obtained by companies that use social networks as a means of advertising, followed by those that use the internet as the main tool to promote their products and services. These findings agree with the previous studies mentioned above, where it is clear that the use of these media contributes to the identification and anticipation of the needs of consumers while minimizing costs and allowing personalized communication.



Table 4. Results of the Kruskal-Wallis test, monthly value of sales - advertising channel

Type of advertising	Total of companies	Average Range	Chi-square	Asymptotic Significance
Presentation cards	311	450.63	24.693	.000
Outdoor ads	273	417.88		
Flyers	82	415.88		
Social Networks	126	574.00		
Internet	97	519.83		
Radio	5	488.50		
Television	4	477.45		

Note: \* significant at 5%

Source. Own elaboration.

Another aspect worth to highlight is that 74% of companies that use advertising do so through traditional media (business cards, outdoor ads, and flyers), and at the same time they show the lowest sales levels compared to the rest. In this aspect, there is a correspondence with Bodlaj and Rojšek (2014) and Zumba, Torres and Aguilar (2016) who argue that in smaller companies the use of marketing tools is applied informally, not in a structured way, but pragmatic, reactive and limited in size and intensity; and among the causes that contribute to this behavior are: fear of losing control of communication, lack of adaptation, aversion to change and doubts about the security of social networks and digital media.

## Conclusions

Mexico is a country that is characterized by having its business fabric led mostly by micro-enterprises, as they represent 95% of establishments and hire about 40% of the employed personnel, figures that are in contrast with the 9.8% contribution to the gross production. Given these scenarios, micro-enterprises need to achieve a greater role in the productivity and competitiveness of markets, since participating with the largest number of economic units in the region compared to other business strata does not give them the guarantee of occupying a better position or better market share. This type of companies suffers to a greater extent the onslaught of a global environment that is increasingly more aggressive and demanding, so that in order to face the imposed barriers it is essential to insert advertising based on modern methods that allow them to stimulate the demand for its products and services while attracting potential consumers.

In this sense, the present study demonstrates, first, that the use of advertising as part of marketing strategy in micro-enterprises have a positive effect on the results of this type of business. It was possible to establish a differentiation between the micro-enterprises that carry out advertising and those that do not, based on the behavior of factors associated with the owner and growth factors such as the size and age of the company. In this sector, in particular, the profile of the owner has a large impact on advertising decisions and therefore on the evolution of the business, in that sense, the characteristics observed in the study sample facilitated the obtaining of this favorable behavior. The analysis indicates that the micro-entrepreneurs with more education, more experience and younger, are related to businesses that carry out advertising strategies with positive impacts on their sales, which is evident because the implementation of knowledge, capabilities and skills acquired during their educational and work training allows them to ensure better outcomes in the solution of problems and will lead to better design of policies that contribute to the good performance of the company.

On the other hand, it was found that the use of advertising becomes more intensive in those companies that grow in number of workers and have been operating in the market for less time. In the same way, and as part of the research objectives, it was demonstrated that the type of media used is closely related to the impact on sales, since micro-enterprises that use social networks and the Internet as part of their strategy in the digital world obtain a better performance compared to those who carry out their advertising by traditional means, results that are in correspondence with the theory and also with the empirical research obtained in previous studies.

Although the evidence reveals the benefit that advertising has in the evolution of the business, Mexican micro-enterprises have not made progress in taking advantage of the technologies and in the transition towards the use of digital media, because most of them (more than 70%) carry out their advertising through traditional channels (business cards, outdoor announcements and flyers) which limits their growth, since they manifest the lowest sales levels compared to the rest of the economic units. This behavior also implies a lower profitability for the business due to the fact that they sustain higher advertising costs. On the other hand, it is important to highlight that even though the majority implements advertising, there is a percentage (39%) that does not incorporate it under any mechanism, which shows that smaller companies in Mexico have not been able to fully recognize that



advertising at the moment is no longer an option, but an important part of marketing strategy. The foregoing, coupled with the limited use of digital tools by owners, especially older ones, puts at risk the possibility that micro-enterprises develop and acquire greater participation and stability in the markets.

Given these contexts, the country needs to promote entrepreneurship in the new generations, as well as create spaces for innovation and the implementation of new business ideas. In this sense, young people become the opportunity to transform the current scenarios; the strong presence of the generation of Millennials, characterized by having a greater use of information technologies such as internet, social networks, mobile devices, among others, makes them habitual users of digital media and generates in them an implicit and natural need to advertise through modern channels in search of immediate results. These advantages allow micro-enterprises adopt new styles of advertising that impel them towards greater competitiveness that impacts on the economic development of the sector to which they belong and, therefore, on the prosperity of the region.

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## Institutional Mechanisms for Implementation of Entrepreneurial Potential of the Population of the Region

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### Abstract:

The article explores the entrepreneurial potential of the Altai Territory, as well as the institutional mechanisms for its realization. The purpose of the study is to develop recommendations for developing the entrepreneurial potential of the Altai region population. The main approaches to the concepts of institutional mechanism and entrepreneurship are presented, foreign experience of entrepreneurship support is studied and the mechanism of support of small and medium business in Russia is studied. The analysis of development of small and medium business in the Altai Territory and analysis of institutional mechanisms for realizing the entrepreneurial potential of the population of the region have been carried out, problems have been identified, and ways for their solution have been examined. Measures have been developed to improve the support of small and medium-sized businesses, which are necessary for the confident growth of the entrepreneurial potential of the Altai region population.

**Keywords:** entrepreneurship; entrepreneurial potential; state support; institutional mechanisms; entrepreneurial activity

**JEL Classification:** L26; L31; L39

### Introduction

Entrepreneurship is one of the inalienable and powerful components of national economic systems, an important component of the reserves of social and economic growth and development. Accordingly, the problems of stimulating its development occupy a special place in contemporary socio-economic relations in the country, first of all, given that the quantitative and qualitative characteristics of small and medium-sized enterprises, the degree of development of the infrastructure of this sector of the real economy to a large extent determine the level of economic growth and is an important component of the formation of a market economy (Bogomolova *et al.* 2017).

The degree of development of productive entrepreneurship depends on the country's economy. Strong in the economic plan, the state provides maximum conditions for business development. This state strengthens its positions and ensures confidence in the future of enterprising citizens. The investors are attracted to the country with the stability economy. Cooperation is completely mutually beneficial. The more profitable entrepreneurship, the more income the state has. The richer the state, the more it can give citizens.

The long-term development of market reforms in Russia, despite the implementation of the principles of a free market economy, the development of the institution of private property, was rather weakly aimed at the

development of small and medium-sized businesses, did not fully ensuring their support and development. And so, small and medium-sized businesses do not occupy a proper place in the Russian economy.

As an integral sector of the market economy, entrepreneurship has a clear regional orientation, as business enterprises plan their activities based primarily on the needs of regional markets, the volume and structure of local demand, and the regional power forms an entrepreneurial climate within its powers. There are many forms and methods of direct and indirect state regulation of the economy in general and of entrepreneurship in particular, which is carried out through an institutional mechanism. Institutional mechanism is a set of bodies and organizations, legislative and normative acts, methods of management and regulation of the economy used by the state.

It is the state that provides the opportunity for the development of entrepreneurship, while entrepreneurs receive a financial result, and the state – the socio-economic effect (increase in jobs, increase the standard of living of the population) (Bezrukov *et al.* 2017). The state develops and implements various mechanisms of state support, the purpose of which is to create a favorable business environment (Queen *et al.* 2017). Support is expressed in state programs of assistance to business, preferential taxation, crediting and insurance (Mirazizov *et al.* 2018, Lukiyanova *et al.* 2018).

Large business is more closely connected with the economy of the country, because, as a rule, it is based on the benefits that this country has provided. The medium and small segment of the business needs more government support, since the organization, promotion, implementation of the case rests with the owner. His efforts to overcome the difficulties may not be enough. Here, assistance and loyalty to public services are required. The more individual incomes the state will support; than more profit will be in the economy. Given a balanced state policy, domestic business can create thousands of new jobs and contribute to the emergence of Russia as an economically developed state (Kudratov *et al.* 2015, Luskatova *et al.* 2016).

Volkova and Popova (2016) believe that the development of entrepreneurship largely depends on regional factors, since in cities of federal importance, small and medium-sized businesses are much better developed than on the periphery, because a large number of businesses it is concentrated there. However, in the literature there are no actual studies of the problems of building up the entrepreneurial potential of the population in specific regions (in particular, in the Altai Territory), which will be disclosed in this article.

## 1. Theoretical Overview

The term "institutional mechanism" was not unambiguously defined in the scientific literature. Effective work of the institutional mechanism is related to government intervention in economic processes and commodity exchange.

Thus, Polanyi (2001) in his work linked the effective work of the institutional mechanism with state intervention in economic processes and commodity exchange. Commons (1934) explained the functioning of the institutional mechanism through the theory of transactions, during the course of which value formation took place. Yashchenko and Nikifirova (2014) define the institutional mechanism as a set of organizational and institutional structures of the economic mechanism that include both separate organizational elements and institutional conditions, as well as the specifics of their interaction, which allow the mechanism to function and achieve goals. According to Veretennikova and Omonov (2017), the institutional mechanism is a sequence of actions of economic agents ensuring their effective interaction through the implementation of formal and informal norms in order to achieve economic results.

The institutional mechanism can stimulate or inhibit the development of the economy. Under the conditions of the administrative-command economic system, there was no holistic economic mechanism, since there was no basis for the functioning of commodity production laws, therefore, there was no economic mechanism. The institutional mechanism in the conditions of an economic, political and social monopoly of the state has got the big sizes. The entire economy was based on directive, centralized management.

If in the conditions of historically normal development the economic mechanism was primary, and the institutional mechanism was its direct continuation and legislative consolidation, then under the conditions of economic transformation the institutional mechanism is called upon to create an economic mechanism. The main goal of the institutional mechanism or centralized regulation is to resolve the contradictions of the spontaneous-market economy for the benefit of stable development of the whole society as a whole. The regulatory and legal framework ensures the effective functioning of each business entity at the micro level.

Institutional mechanism is largely due to the level of development and efficiency of state regulation of the economy. Of particular importance at present are mechanisms to support entrepreneurship. According to Svirchevsky (2012), entrepreneurship is an economic category where the main subject is an entrepreneur rationally combining factors of production, organizing and directing production with the aim of obtaining entrepreneurial

income. With the development of entrepreneurship, there are hopes for an increase in the social structure of Russia of the middle class – the foundation of social stability and modernization (Luskatova *et al.* 2016).

Features of Russian entrepreneurship are:

- the search by enterprises for additional sources of income, often not related to the main activity;
- low technical equipment and illiteracy of entrepreneurs in the management sphere;
- addressing employment problems;
- tax and credit policies aimed at stimulating the development of entrepreneurship (Kazimagomedova *et al.* 2017).

The entrepreneur's abilities are one of the economic resources. The entrepreneur himself is a person, connecting such factors of production as: land, labor, capital, and recently information comes to them, it's not for nothing that they say: who owns the information – owns the world. An entrepreneur is a person who knows how to take responsibility, knows how to take risks. He understands that he needs to pay employees' salaries, spend money on various production needs, while not knowing what his future profit will be. He believes that profits will be more losses.

Formation and development of entrepreneurship is an important direction of economic policy of any country. In countries with developed market economies, where the number of small and medium-sized enterprises is between 70 and 90% of the total number of enterprises (Kudratov *et al.* 2015). In countries that primarily represent Hong Kong, Singapore, South Korea and Taiwan, small and medium-sized enterprises account for 91-98% of all enterprises operating there. In export, their share is 17-66%. In the United States, small businesses account for 35% of net income, 30% of total exports, and 50% of employment in the private sector of the country. The issue of small business development in the United States belongs to the administration of the Small Business Administration (SBA), which has numerous regional offices that interact with the Business Development Centers (established with universities or administrations).

In the UK, the state is trying to support small businesses, primarily through the banking system. In particular, each bank has its own lending program. The innovative focal point of Portugal (IRC Portugal (ISQ)) manages one of the two information centers in Portugal and supports innovations in the framework of transnational cooperation on technology transfer to Europe.

The experience of the countries of Eastern Europe on developing entrepreneurial potential is also important (Suchart 2017). In such an Eastern European country as Slovakia for the assistance of small and medium-sized enterprises is responsible for the "People's Agency for the Development of Small and Medium-sized Entrepreneurship" with a center in Bratislava. It focuses its activities on the area of improving legislation, assisting entrepreneurs in obtaining loans and guarantees for them. In the framework of international activities, it fulfills the management function for the development of the PHARE program of the European Union. With German partners, the agency organizes internships, educational and training courses (Rennemo 2015). In relations with Austria, it focuses on cooperation related to raising the level of consultations in the new regional advisory and information centers, as well as to help in the production of development programs for small and medium-sized businesses, especially on the basis of generalized information from tax declarations. The state strategy of small business development in another major Eastern European country, in Poland, is focused on the following tasks:

- Increasing the innovativeness of small enterprises;
- activation of small business development in the eastern regions of the country;
- improving the system of training and training of personnel for small business;
- facilitating the search for financial sources for business; regulation of the economy and minimization of bureaucratic procedures;
- promotion of export activities of small enterprises.

Effective strategic tools that are used to enhance the development of entrepreneurship in Poland are: special economic zones, industrial and technological parks, business incubators, clusters, loan and guarantee funds, support for local initiatives.

So, the policies of developed countries are aimed at creating an enabling environment for the development of small and medium-sized businesses and an important role in this process is provided to the state. State support is expressed in the establishment of mutual guarantee companies, mutual financing, organizations that protect the interests of small business, in the adoption of regulatory acts on tax benefits, on the provision of financial assistance, in facilitating the provision of information, education and consulting services.

As for Russia, the state: creates business development systems, creates conditions for the optimal development of business throughout the country, develops measures to create jobs by business entities, supports competition, stimulates investment activity, develops and improves legal legislation in the field of entrepreneurship (Morozko 2017).



Mechanisms for regulating and supporting entrepreneurship are divided into financial, organizational, economic, property and information. The system of state support in Russia consists of:

- legal aspects, administrative, regulatory documents that promote the legitimate development of business;
- the government administration, which is the institutional structures responsible for the proper functioning of business (Government of the Russian Federation, Ministry of Economic Development, government bodies in the constituent entities of the Russian Federation);
- public infrastructure, which includes commercial and non-profit organizations, which are necessary to implement activities supporting business.

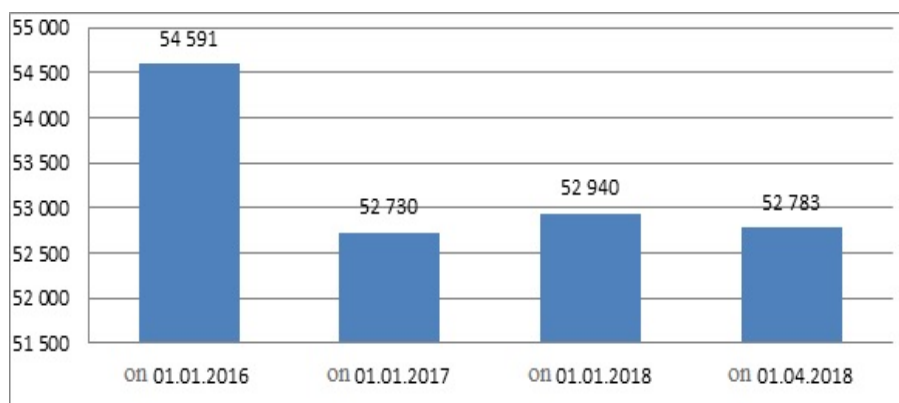
The implementation tools are: federal programs, municipal programs, regional programs, support infrastructure. The most important state normative legal act is the Federal Law "On the Development of Small and Medium-Sized Enterprises in the Russian Federation" (2007). The infrastructure of entrepreneurship support consists of centers and agencies for the development of entrepreneurship, state and municipal entrepreneurship support funds, credit promotion funds, joint-stock investment funds and closed mutual funds, technology parks, scientific parks, innovation and technology centers, business incubators, business training centers, agencies for the support of exports of goods, leasing companies, consulting centers, industrial parks, etc.

## 2. Results and Discussion

### 2.1. Analysis of Small and Medium-Sized Businesses in the Altai Territory

The business area of the Altai Territory unites 87.8 thousand economic entities. Among them, 34.9 thousand are medium and small enterprises, including microenterprises, and 52.9 thousand are individual entrepreneurs. Dynamics of individual entrepreneurs in the Altai Territory for 2015 - 2018 is presented in Figure 1. Compared to 2015, in 2018 their number decreased by 1,808 people, and compared to 2017 – by 157 people, which is a negative trend (Management of the Altai Territory 2018).

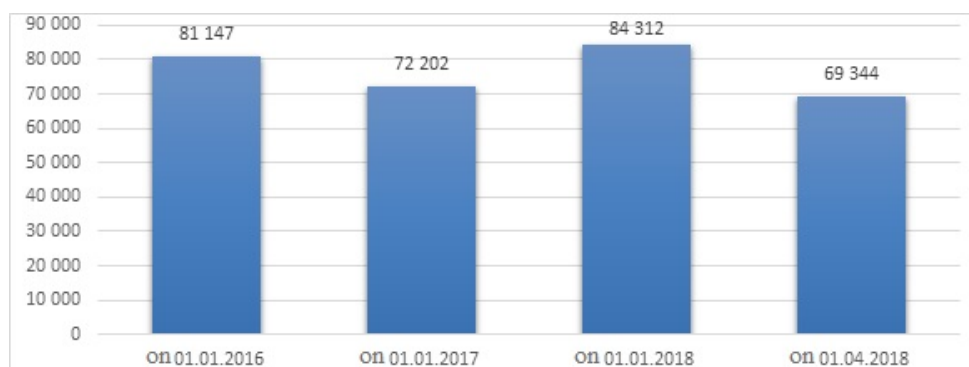
Figure 1. The number of individual entrepreneurs in the Altai Territory for 2015-2018 years, person



Source: Compiled by the authors.

Average number of employees of small enterprises in the Altai Territory for 2015 - 2018 decreased: in comparison with 2015, by 11803 people, and in comparison with 2017 by 14968 people, which is also a negative trend (Figure 2) (Management of the Altai Territory 2018).

Figure 2. Average number of employees of small enterprises in the Altai Territory in 2015-2018, people

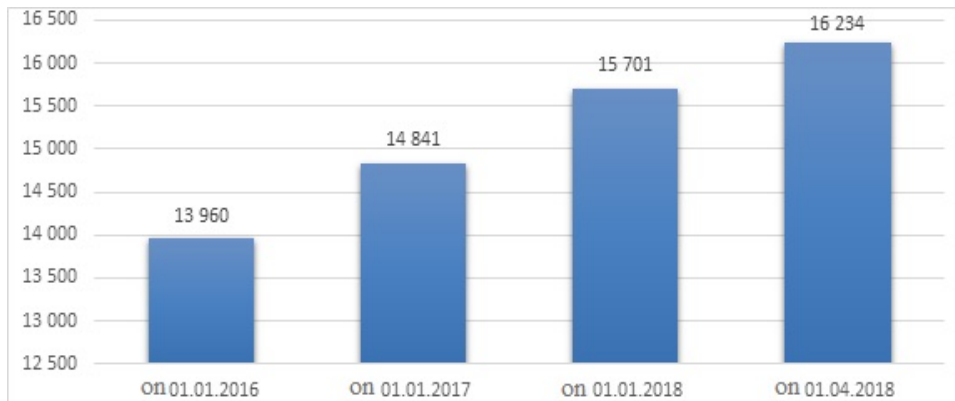


Source: Compiled by the authors



Average monthly salary of one employee at small enterprises in the Altai Territory for 2015-2018 annually increased and amounted 16234 rubles in 2018. (Figure 3) (Management of the Altai Territory 2018).

Figure 3. The average salary of an employee at small enterprises in the Altai Territory in 2015-2018, rubles



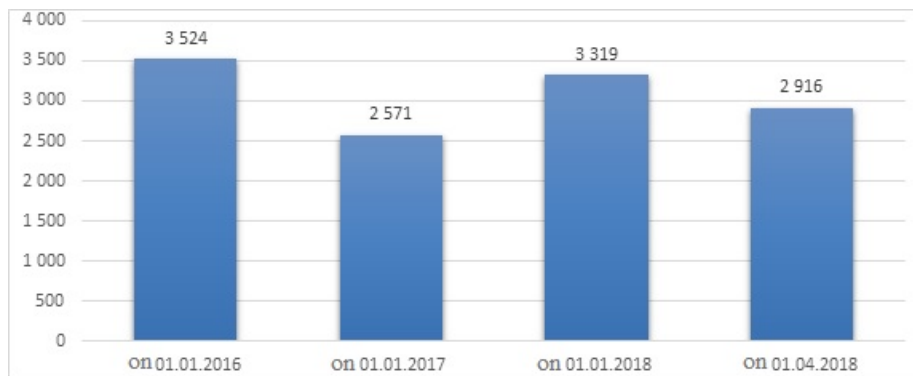
Source: Compiled by the authors.

Among the subjects of small and medium-sized business are 65.2% of the region's enterprises – legal entities, including:

- 82.3% of hotel business organizations and public catering establishments,
- 78.1% of legal entities employed in processing industries,
- 77.3% of construction companies,
- 77.0% of companies engaged in transportation, storage,
- 76.0% of enterprises engaged in trade and repair of motor vehicles and motorcycles.
- 65.5% of SMEs employed in the agricultural sector.

The dynamics of small enterprises is presented in Figure 4. Their number in Altai Territory in 2015-2018 decreased in comparison with 2015 by 608, and compared to 2017 by 403 (Management of Altai Territory 2018).

Figure 4. Dynamics of small enterprises in the Altai Territory in 2015-2018, units



Source: Compiled by the authors

In the Altai Territory, the industry structure of operating companies is changing. Over the past four years, the share of the trade sector has decreased from 40.7% in 2014 to 38.9% in 2017. In 2017, small enterprises shipped goods of their own production, performed works and services on their own by 132.7 billion rubles, which is more than 2015 and 2016 (Figure 5). A quarter of this volume of work was done by enterprises in the sphere of manufacturing industries (Management of the Altai Territory 2018).

Figure 5. Shipped by small enterprises goods of own production, performed works and services on its own in the Altai Territory for 2015-2018, million rubles



Source: Compiled by the authors.

One of the most important indicators of entrepreneurs' activity is their turnover, which directly affects both the development of the region and the GDP of the entire state (Luskatova *et al.* 2016). Turnover of small (including micro) and medium-sized companies in 2017 amounted to 530.0 billion rubles. The share of turnover of these economic entities in the total turnover of all companies in the province was 46.1%. Turnover of small enterprises in 2015-2017 annually increased, despite the decrease in their number (Figure 6) (Management of the Altai Territory 2018).

Figure 6. Turnover of small enterprises in the Altai Territory in 2015-2018, million rubles

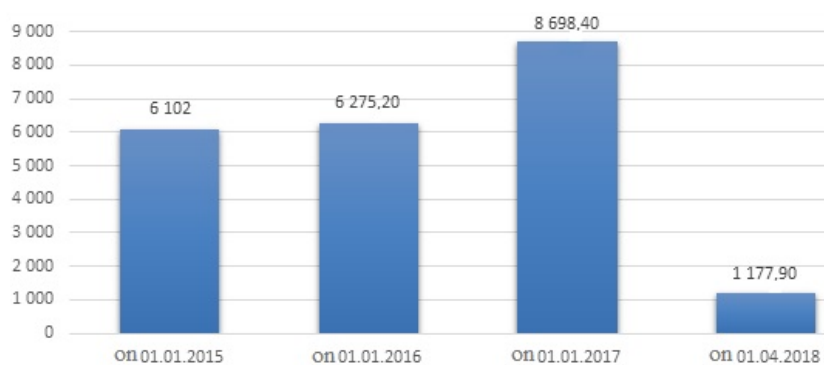


Source: Compiled by the authors.

If we compare the turnover of products (services) produced by small enterprises (including microenterprises and individual entrepreneurs of the Altai Territory and other regions of the Siberian Federal District), then in 2017 the growth rate in the Altai Territory was 109%, in the Altai Republic – 125% The Republic of Buryatia – 103%, the Republic of Tyva – 98%, the Kemerovo Region – 114%, the Omsk Region – 93%, the Krasnoyarsk Territory – 114%. That is, the indicator of the Altai Territory is the average in the district (Panichkina and Masych 2016).

The investment activity of small and medium-sized enterprises has become noticeably more active. Investments in fixed assets in 2015-2017 annually increased and amounted in 2017 to 8.698.4 million rubles. (Figure 7) (Management of the Altai Territory 2018).

Figure 7. Investments in fixed assets in the Altai Territory in 2015-2018, million rubles



Source: Compiled by the authors.

## 2.2. Infrastructure of State Support for Small and Medium Business

In the Altai Territory, effective cooperation with federal development institutions, including the federal SME Corporation and the Russian Export Center, has been built in all major areas of support for small and medium-sized businesses in the region. Jointly implemented measures for credit-guarantee, property, legal, informational, educational, marketing support and development of business entities as potential suppliers are expanding every year, moving to a new quality level.

To date, all types of basic infrastructure of state support for small and medium-sized businesses (excluding the Techno Park) are functioning on the territory of the region – more than 80 objects. Each year more than 20,000 consulting services are provided by the support infrastructure organizations. In 2017, 27 thousand consulting services were provided, and more than 300 seminars and trainings on topical business issues were attended by 9,000 potential and current entrepreneurs.

With the assistance of the Export Support Center, in 1717, 17 export contracts were concluded for the delivery of goods to China, Uzbekistan, Kazakhstan, Armenia, Belarus, Tajikistan, Mongolia and Latvia in the amount of 342.2 million rubles. In order to expand the range of services rendered by the organizations of the service support infrastructure in 2018, federal budget funds were raised in the amount of more than 15 million rubles to support the activities of the Center for Entrepreneurship Support. Center for Social Innovation, Export Support Center.

In the composition of infrastructure, the largest share in the number of services rendered is occupied by municipal information and consulting centers for supporting entrepreneurship. In 2018, one of the tasks of developing the support infrastructure is the standardization of their activities, an obligatory element of which will be the improvement of the competence of specialists of the Centers. Passage of obligatory attestation of ICC specialists is the main condition for their participation in the regional competition "Best ICC".

One of the stages of work to improve the infrastructure support system in the province has been the formation of a single organization – the Altai Fund for the Development of Small and Medium-sized Entrepreneurship, which provides comprehensive business assistance at all stages of activity. The Altai SME Fund will become a single management body for organizations that form the infrastructure for supporting business entities in the region. For this purpose, it is planned to conclude agreements on interaction with all organizations of the support infrastructure in order to provide the entire range of services of infrastructure organizations in the "one-stop-shop" format on the Fund's site, as well as in the MFC for business. In 2017, 16 specialized windows for entrepreneurs were created in Barnaul, Biysk and Rubtsovsk.

In 2017, municipal information and consulting centers for supporting entrepreneurship providing comprehensive services to business entities in the "one-stop-shop" mode at the municipal level, 38582 services were provided, 556 training seminars with the participation of 13346 entrepreneurs were organized. The issue of creating service centers on the basis of banks (support infrastructure organizations) and the construction of a production business incubator in Rubtsovsk is also under consideration.

Various educational projects for entrepreneurs are being implemented in the Altai Territory. In 2017, 150 managers and specialists of business entities underwent professional retraining and professional development. Since 2017 federal educational projects have been implemented in the region. For this purpose, the relevant agreements have been concluded by the management. In particular, on the site of the Center for the Support of Entrepreneurship, trainings were organized on the training programs of Corporation SME Corporation, including trainings on the programs "Businessman's Alphabet", "School of Entrepreneurship", "Mama-Entrepreneur", in which 314 people took part.

The export support center implemented the educational project of the Russian Export Center under the program "Organization of Export Activities of Enterprises", within the framework of which training seminars were held with the participation of 88 representatives of small and medium-sized businesses. To train entrepreneurs on federal educational programs, regional trainers have been trained. For social entrepreneurs in the territories of the province, training sessions are organized on the program "Fundamentals of Social Entrepreneurship". In addition, an agreement was concluded with the Joint-Stock Company "Business Environment" on the implementation of the "Business School" educational course, which provides training seminars and trainings involving the best business trainers in Russia.

Also, in 2018 the Altai Territory joined the online program "Business Class", implemented by Sberbank PAO and Google, which is especially important for entrepreneurs working in rural areas. Official sites, as well as pages of infrastructure support in social networks form a single electronic infrastructure for the support and development of small and medium-sized businesses in the Altai Territory:

- Altai Territory management website for the development of entrepreneurship and market infrastructure – [altsmb.ru](http://altsmb.ru), in 2017 the site was used by more than 70238 thousand people;
- site of NO "Altai Guarantee Fund" – [altfond.ru/agf](http://altfond.ru/agf);
- NOMC site "Altai Micro-Loan Fund" – [altfond.ru/afm](http://altfond.ru/afm);
- The site of the regional Center for Entrepreneurship Support – [altaicpp.ru](http://altaicpp.ru), in 2017 visitors to the site were 62385 people;
- site of KGBU "Altai Business Incubator" – [altaicpp.com/abi](http://altaicpp.com/abi);
- The site of the Altai regional center for coordination of support for export-oriented small and medium-sized businesses [www.export22.ru](http://www.export22.ru), in 2017 the visitors of the site were 11300 people;
- site of the MBU "Biysk Business Incubator" – [incubator22.ru](http://incubator22.ru);
- portal of small and medium business of the Altai Territory – [smp22.ru](http://smp22.ru), in 2017, the portal visitors were more than 25,000 people;
- sites of public associations of entrepreneurs of the region, including: Communities of Young Entrepreneurs of the Altai Territory ([altsmp.ru](http://altsmp.ru)), Altai Chamber of Commerce and Industry ([alttpp.ru](http://alttpp.ru)), Altai Union of Entrepreneurs ([asp22](http://asp22)).

The Altai Territory Administration for the Development of Entrepreneurship and Market Infrastructure provides system coverage of issues related to the development of the business sector, the implementation of the regional program for the development of small and medium-sized businesses, the effectiveness of government support measures, including federal projects and initiatives in the region. For this purpose, interaction with editorial offices of various mass media is organized, together with which press tours, briefings, press conferences, Internet forums are organized, etc. Actual issues are highlighted in the permanent headings of the regional print media and TV and radio channels: "People business", "Provincial Business", "Business and Power" (newspaper "Altai Truth"); "Business without days off" (program "Vesti-Altai" GTRK "Altai"); "The Word and Deed of the Altai Business" (Radio Rossii); "Business class" (radio channel "Katun FM").

Property support to small and medium-sized businesses is provided in the form of long-term use of municipal, state property included in the relevant lists. To date, a list of regional property, lists in all urban districts and municipal districts, as well as in 25 urban (rural) settlements has been established in the Altai Territory. The list includes 464 objects of municipal and state property. In the lease there are 227 objects (48%). These lists are subject to annual addition of new objects.

A working group has been created in the Territory to provide property support to small and medium-sized businesses. Its main task is to find additional sources for the formation and expansion of lists of property, including through unused and inefficiently used state and municipal property. The decision to grant state preferences is made by the Ministry of Property Relations of the Altai Territory in the presence of a decision of the Altai Territory Administration for the Development of Entrepreneurship and Market Infrastructure on giving consent for the provision of preferences.

Also, property support is provided by business incubators in Barnaul and Biysk. In 2017, support was provided to 49 small business entities. Residents of business incubators created 147 jobs, the annual turnover of residents amounted to 141 million rubles, the volume of tax deductions – 8.6 million rubles.

The work of the regional microcredit company and the guarantee fund was aimed at solving the problem of availability of contingent resources to SME entities.

The regional guarantee organization provides guarantees to financial institutions on loans, leases, bank guarantees, loan agreements. The year 2017 for the Fund is characterized by a significant (compared to 2016): growth in the volume of provided guarantees – 2.8 times, the volume of loans under the guarantee of the Fund – 1.8 times. This, among other things, was facilitated by differentiation of the guarantee products of the fund by sectors and priorities of support, which increased their accessibility for various categories of business.

The regional microfinance organization "Altai Micro-Loan Fund" provides support to entrepreneurs by issuing loans for purposes related to the development of entrepreneurial activities. Borrowed funds for the development of entrepreneurial projects provided by the regional micro-loan fund on preferential terms are one of the most sought-after forms of state financial support for small businesses for many years. Since 2009, the regional fund has provided more than 4,000 microloans to the small business of the region for a total of 2.4 billion rubles. The share of the Altai Micro-Loan Fund in the market of microfinance organizations of the region is 95%.

In 2017, 334 small business subjects used the borrowed funds of the microfinance organization in the Altai Territory for a total of 480.6 million rubles. Compared to 2016, the volume of funds issued increased by 110 million rubles. Every third borrower raised additional funds in the fund for the development of investment projects. In the

total volume of loans issued by the Fund this share is 165 million rubles. The volume of the fund's capitalization exceeds 500 million rubles, which makes it possible to provide high-quality financial support for significant projects of the small business of the region on preferential terms.

Also, federal programs of concessional lending (at rates of 9.6% and 10.6% per annum) have proved to be effective tools for supporting entrepreneurship in the Altai Territory – the SME Lending Promotion Program implemented by the Office in cooperation with the SME Corporation and the Preferential Loan Program implemented jointly with Ministry of Economic Development of Russia. According to these programs, in 2017, on concessional terms, projects of 39 entrepreneurs were financed with an additional attraction of more than 3 billion rubles to the economy of the region. Financial support mechanisms for SMEs: grants in priority areas, business initiatives.

According to the results of competitive procedures, eight business entities in the Altai Territory engaged in the processing of agricultural products and wild plants, construction and production of construction materials, roadside service, and medical practice in the countryside received state support for a total of 8.2 million rubles.

Together with the municipalities, the business cards of the city districts and municipal districts are updated each year, designed to identify the sought-after and priority areas for the development of small and medium-sized businesses and allow each municipal entity to assess its attractiveness to a potential investor, as well as prospects for implementing business projects.

Also, on a systematic basis, interaction with administrations of municipal areas and urban districts is organized on the issues of reducing arrears in the context of special tax regimes, introducing additional information to the Single Register of SMEs, encouraging business entities to submit statistical reports and increasing their investment activity.

### 2.3. Prospects and problems of development of small and medium-sized business in the Altai Territory

Based on the analysis of mechanisms for realizing the entrepreneurial potential of the Altai Territory population in 2015-2018, the following trends were identified:

- decrease in the number of individual entrepreneurs;
- decrease in the number of small enterprises;
- reduction of the average number of employees of small enterprises;
- increase in average salary in small enterprises;
- increase the shipment of goods of own production of small enterprises;
- increasing the turnover of small businesses;
- increase in investments in fixed assets.

Many authors consider the problems and suggest ways to increase the entrepreneurial potential of the population of Russia. For example, Panichkina and Masych (2016) believe that small and medium-sized businesses need to join business clusters, which will allow them to receive positive synergistic effects of the territorial agglomeration, as well as significantly reduce the risks of activities. According to Lvov (2018), the primary measures that will stimulate the development of entrepreneurship are: easing of the tax burden, increased financial support, reduction of administrative barriers, combating corruption, improvement of the regulatory framework for removing existing administrative and other barriers for future business development.

It is possible to cite the views of some researchers on the problems of small business development in Russia as a whole, which are also relevant for the Altai Territory. So, Rekuta (2018) believes that at present the development of entrepreneurship is hampered:

- lack of financial security and bureaucratic delays;
- frequent absence of a clear, detailed plan;
- problems of small business crediting (according to experts, only 30% of all applicants receive credit requests in our country, and microcrediting is available to even fewer – only 10%);
- the impact of sanctions on business (rising food prices, the appreciation of the euro and the dollar, restrictions on entering the international market);
- high share of shadow employment;
- a massive decline in incomes in the population.

Actually, the ways of solving the development of entrepreneurship by different authors are seen in different ways. Thus, Wegner-Kozlova (2015) believes that the qualitative improvement of the entrepreneurial potential at the regional level will be facilitated by:



- specification of programs for the development of entrepreneurship, taking into account the economic specifics of the socio-economic system of the region;
- definition and formalization of economic activities priority for the development of innovative industrial entrepreneurship for the implementation of state support;
- organization of systematic field studies of entrepreneurship using the method of continuous monitoring, with the purpose of identifying factors that hamper its development;
- clarification of additional indicators of business performance;
- ensuring security and protection against corruption and crime of innovative-active manufacturing enterprises through the organization of a system of state insurance of such companies;
- orientation of work of large enterprises of the region on interaction with small business.

From the point of view of Abuzyarova (2018), for the development of entrepreneurship, it is necessary: expand the support of the Business Lending Assistance Fund, reduce interest rates on loans, assisting leasing and factoring companies so that they reduce the requirements for providing their services to business entities, introduce new programs to support entrepreneurship.

In the opinion of the author, the main areas of work to disclose the entrepreneurial potential of the region's population are:

1. In the sphere of formation of favorable conditions for doing business:
  - formation of an integrated regional monitoring and forecasting system for the state and development of the small and medium-sized business sector;
  - identification of "growth points" of business, including at the level of municipal entities of the region;
  - stimulating demand for SMEs;
  - further improvement of the project approach to managing the development of the small and medium-sized business sector;
  - creation of competitive conditions for conducting legal business and withdrawing from the "shadow sector";
2. In the sphere of development of the state support infrastructure:
  - implementation of the service model of SME support through the quality work of the support infrastructure organizations;
  - further reform of regional and municipal control in order to reduce the administrative burden on the business;
  - creation of a regional integrated system of business education;
  - expansion of measures of property support for small and medium-sized businesses.
3. In the field of financial support:
  - development of credit and guarantee support for entrepreneurs using the capabilities of a regional guarantee fund and a micro-loan fund;
  - attraction of SMEs to participation in federal programs for concessional business lending, including using the mechanism of cost recovery for banks that are lending to small and medium-sized businesses at a reduced interest rate;
  - the implementation of measures for the organization and development of business in the territory of single-industry towns, including in the framework of TOSER;
  - expansion of the list of additional measures aimed at the development of agricultural production and agricultural consumer cooperatives and their unions.
4. In the consumer market:
  - development and coordination of the activities of the state program of the Altai Territory to ensure consumer rights;
  - the development of a "road map" for the implementation of the Concept of the development of trade and services in the Altai Territory;
  - implementation of systematic interaction with municipalities to ensure the implementation by small business entities of the consumer market requirements of federal legislation regarding the introduction of online cash registers, electronic veterinary certificates, marking of goods, accessibility of facilities for low-mobility citizens, and antiterrorism protection.
5. In the field of licensing the kinds of activities:
  - implementation of state control (supervision) over compliance with mandatory requirements;
  - further legalization of the alcohol market through the EGAIS;
  - maximization of the provision of public services in electronic form through EPAU (Abuzyarova 2018).



Thus, in recent years, the entrepreneurial activity of the population of Altai Territory has been declining, so for its development it is necessary to strengthen measures of state support for business. The author's position is that it is necessary to take additional measures in the region to create favorable business conditions, to develop the infrastructure of state support, additional financial support, in the consumer market and licensing. These measures can radically change and improve the position of entrepreneurs, improve the efficiency of their work.

## Conclusions

Formation and development of entrepreneurship is an important direction of the state's economic policy. Support mechanisms for entrepreneurship are important. Institutional mechanism is a set of bodies and organizations, legislative and regulatory acts, methods of management and regulation of the economy used by the state. The institutional mechanism is influenced by the level of development and effectiveness of state regulation of the economy. Mechanisms for regulating and supporting entrepreneurship are financial, organizational, economic, property and information. The system of state support mechanisms in Russia includes: legal aspects, administrative and regulatory documents; government administration; public infrastructure.

The organization of an infrastructure of the state support of small and medium business provides consulting, financial, property support, as well as support in the sphere of increasing the educational level of business entities. In recent years, with a decrease in the number of people employed in small and medium-sized businesses, there has been an increase in the quality of enterprises' performance—steadily increases the volume of turnover of enterprises per employee, and there are growing the indicator of shipment of own-produced goods, works and services. The data of statistics allow making a conclusion on increase of labor productivity in small and medium-sized enterprises, expansion of volumes and modernization of production of enterprises. Out of negative trends, one can single out the decrease in the number of small business entities.

Taking into account the identified problems of entrepreneurship in the Altai Territory, we believe that its development will be facilitated by: creation of favorable business conditions, development of the state support infrastructure, provision of financial support, development of the consumer market, improvement of licensing.

At the same time, there is a need to further study the institutional mechanisms for realizing the entrepreneurial potential of the population of the Altai Territory. The most promising areas of further research in the area of institutional mechanisms for realizing the entrepreneurial potential of the population is the study of the experience of the developed country, which will provide an opportunity to find out which tools are the key to the development of entrepreneurship.

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## The Impact of 21<sup>st</sup> Century Skills on the Life Satisfaction of the General Public

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### Abstract

Certain skills have been identified as the key success factors of the 21<sup>st</sup> century. However, we hardly know about their impact on a person's quality of life. It is the intention of this study to investigate the influence of these skills on life satisfaction, along with a few human characteristics that will be discussed. The six skills of the 21<sup>st</sup> century that will be discussed include problem solving, critical thinking, creativity, communication, collaboration and technological skills, and the two human characteristics are social responsibility and being a nature lover. A total of 510 responses were collected from shoppers in Bangkok. The results of the multiple regression analysis using demographic variables as the controlled constructs indicated that critical thinking, problem-solving, communication, and technological skills, as well as age and household income, have a positive impact on life satisfaction. Critical thinking was seen to be the most needed skill to be targeted especially for the older and the low household income segments, whereas technology skills should be promoted in the high household income segment. In order to better the life satisfaction of the young, a change is needed on their part—they need to be socially responsible and need to change from being negative to being positive. Further, older people's strengths in problem solving should be utilized in order to increase the quality of everyone's life.

**Keywords:** 21<sup>st</sup> century skill; future skill; life satisfaction; happiness; quality of life

**JEL Classification:** I2; I3

### Introduction

According to National Education Association (2010), fifty years ago the economies were basically focused on farming and manufacturing, and at the time it was considered sufficient to master the three essentials or the three r's, reading, writing, and arithmetic, as they were called. In the modern world however things have changed drastically, and that three r's are no longer enough for a person to survive and prosper. In order for students today to be able to compete in the global world, they must be in the possession of other skills, such as being creators, proficient communicators, collaborators, and critical thinkers - what is now called the four c's.

Life today is so much more complicated than it was in the past, and this complexity pertains not only to civic life but also to one's work life. In the present century, there is a new kind of literacy required: information and technological literacy, and this extends far beyond the kind of literacy that was considered to be sufficient in the past. Today, what can be termed civic literacy is extremely important and should be included in the curricula of our schools, as only with this literacy can the challenges in our communities be met. Financial meltdowns, global warming, diseases that recognize no borders, and immigration reform are just a few of the issues that today's students need to be aware of, and they need to be ready to face these challenges.

In addition, workforce skills and the demands of the workforce have changed drastically recently, and the rapid decline in "routine" work has been documented by many researchers. At the same time, jobs involving non-routine skills, including analytic and interactive communication skills, have increased. Today's job market requires the skill to think critically and to interact with people from many linguistic and cultural backgrounds; this has been termed cultural competency in the literature.

This constantly-changing workforce has created a deep need for innovation, as Ken Kay, CEO of EdLeader21, has remarked: "Today's students need critical thinking and problem-solving skills not just to solve the problems of their current jobs, but to meet the challenges of adapting to our constantly changing workforce." Given the present complex world and the problems that it thrusts upon nearly everyone, it is necessary that everyone exhibit personal social responsibility in solving these issues. When one says that the world is changing, this means that each community can be seen to be undergoing constant change and development, and all of the individuals that comprise these communities can take part in this development in their own ways, for example in cleaning streets, organizing events, and providing social activities for children or the elderly to name just a few. Individual social responsibility also can be expressed in making donations to social causes, whether they be cultural, ecological, or social. In order to tackle the nearly universal problems of deteriorating environmental quality and the universal problem of global warming, it is mandatory that people have respect and love for the environment in which

they live; this characteristic of being what can be called a “nature lover” separates people that are pro-environment from those that are not (Leelakulthanit 2017). The question that remains, however, and on which this study will focus, is whether the above-mentioned desirable 21<sup>st</sup> century skills and personal characteristics that are supposedly to be trained in the classroom can actually contribute positively to people’s life satisfaction.

## 1. Literature Review

### 1.1 Problem-Solving

How can companies help their employees increase their control over their non-work life? One possibility is to train employees in the ability to solve problems and to encourage them to learn how to reach the important goals in their lives. Such training would necessarily involve the enhancement of their ability to solve problems and to do it more self-efficaciously, for in this way their satisfaction with their work and life in general would be enhanced. It has been widely discussed in the literature that problem-solving skills can be improved with training (Mayer 1983), and the most common problem-solving training involves practice with the basic steps of defining and formulating the problem. The person must first understand the problem that is to be solved; if you don’t know what the problem is how can you solve it? Training must also include according to the literature, setting measurable goals, and if it is considered to be helpful, generating a lot of possible solutions, from which at least one should be chosen. A person should also learn to implement ideas, evaluate outcomes, and whenever necessary repeat parts of the process (D’Zurilla and Goldfried 1971). In fact, training in problem solving has been connected with a person’s sense of control (Duckworth 1983), and therapy in problem-solving has been found to lead to decreased depression (e.g., Nezu 1986, Nezu and Perri 1989). Additionally, connections have been found between positive problem-solving attitudes and both positive mood states and a person’s satisfaction with his or her life (D’Zurilla and Nezu 1999).

A theoretical basis has also been suggested for expecting problem-solving training that will assist employees in feeling more satisfied with their lives. Bandura’s social cognitive theory suggests that a person’s improvement in his or her skills (including problem-solving skills) is mediated by the individual’s perception of his or her self-efficacy; that is, the person feels that he or she can deal with a given situation effectively, even when that situation is not expected (Bandura 1986, 1997). Evidence has also been put forward that a person’s increased ability to master situations can be generalized to other situations (Bandura 1997). Indeed, social cognitive theory suggests that cumulative accomplishments can be one of the most influential sources of information about the idea of efficacy (Bandura 1997), and for this reason intervention or training that teaches problem-solving skills and encourages the individual to learn to solve problems on his or her own will likely increase self-efficacy levels as part of increasing both affect and satisfaction. It can be hypothesized then that problem-solving skills can have a positive impact on a person’s life satisfaction.

### 1.2 Critical Thinking

As the world today is of a complicated nature, the ability of a person to think is crucial, particularly regarding his or her ability to communicate (Lipman 2003). When people think, they are required to be rational and to be detailed in their thinking. Indeed, the ability of a person to think critically contributes strongly to his or her ability to follow the evidence regarding any issue (Ennis 1991, 1996, 2011, Valenzuela *et al.* 2011, Suter 2012). Critical thinking is a big part of what makes us human, and provides us with a tool that allows us to act “correctly” in any given situation (Lewis and Smith 1993). Further, critical thinking can be applied to both so-called reasoning in scientific procedures as well as in our daily lives, and it offers an avenue for analyzing facts using objective perspectives (Garrison *et al.* 2001). Again, critical thinking is a significant and essential part of human thought (Siegel 2010), and at every step of the education system, critical thinking plays or should play an important role (Scheffler 1989). When people think critically, they not only are able to possess good perspectives on given issues, but they can also consider the quality of their thinking and then act accordingly. In this way, rational decisions can be made thanks to a person’s ability to think critically (Paul 1990).

Along with critical thinking comes certain dispositions and skills (Ennis 1996), and these dispositions come alive when people believe that their own thoughts are right and true (Ennis 1987). This is so because when people think critically they can obtain detailed information on the topic in which they are interested, offer alternative thoughts, and make objective decisions regarding other people’s thoughts by putting themselves in their “cognitive position” and take other people’s prosperity into consideration (Ennis 2011). All of these can be considered critical thinking dispositions (Ennis 1996). Critical thinking can be considered an essential element of life because it is a process whereby all thought processes are considered, actions are taken from among a possible multitude of choices, and other people’s thoughts are taken into consideration (Ennis 1991). People that have the ability to think critically can help themselves and other people live prosperously (Ennis 2011). It can be seen that critical thinking

skills can be considered among the most important 21<sup>st</sup> century skills (Cottrell 2011) and these skills have an important place in both the environment of education and in our daily lives (Slameto 2014). In education, the goal of many teachers is to pass on critical thinking skills to their students (Choy and Cheah 2009, Emir 2013, VanTassel-Baska *et al.* 2009) because this will make learning for them easier in the future and so that they can become life-long learners (American Philosophical Association 1990) and continually develop their creativity (Facione, Facione, and Giancarlo 2000, Paul and Elder 2008). The question, "What kind of convenience does critical thinking disposition create in life?" shaped this research. Berry and West (1993) claimed that critical thinking makes it easier for a person to choose his or her life goals. Similarly, Paul and Elder (2008) claimed that students that are able to learn to think critically are able to reach their goals and objectives more easily than those that are not able to do so. On the other hand, when the related literature was examined, it was found that there was no research that analyzed the relationships among critical thinking, meaning in life, and life satisfaction. However, there were a few studies examining the relationships between critical thinking and psychological well-being (Flor, Bitá, Monir and Zohreh 2013). This study aims to close this gap. It is hypothesized in this study then that critical thinking skills are positively related to one's life satisfaction.

### 1.3 Creativity

Creativity, according to Ferrari *et al.*, is the ability to generate and apply new ideas, techniques, and perspectives (Ferrari *et al.* 2009), and Lucas and Hanson have asserted that this is often carried out in a collaborative environment (Lucas and Hanson 2016). When you think of creativity in connection with the discussion above concerning problem-solving skills, it can be seen that creativity is a major component of thinking purposively; that is, using orderly and organized thought processes. From this perspective, being creative is connected to the learner's cognitive ability, and this includes his or her ability to analyze and evaluate (Sternberg 2006). Indeed, it has been asserted that ideational thought processes are an essential aspect of the creative individual (Kozbelt *et al.* 2010). Not only that, but creativity has been seen to connect with social and personal management skills as well. From this point of view, creative is not only connected with the arts as it is in perhaps the average person's mind; but it is also a pre-condition for innovative behavior in all areas of life, and this includes the learning setting and the workplace (Partnership for 21st Century Learning 2015). Creativity then can be linked to the effectiveness of other life skills, such as critical thinking and problem identification (Sternberg 2006), problem-solving (Torrance 1977), and self-management.

As mentioned at the outset of the present paper, society is changing at a rapid pace nowadays, and this has made it necessary for individuals to follow suit and change with it. If a person is flexible and creative, he or she will have the capability to cope with these multifarious changes that he/she has to face. Creativity then can be thought of as an essential part of the problem-solving process (see for example Mumford, Mobley, Uhlman, Reiter-Palmon, and Doares 1991), and creative ideation only adds to a person's greater flexibility (*e.g.*, Runco 1986), hence fostering his or her well-being (*e.g.*, Carson, Bittner, Cameron, Brown and Meyer 1994). It is hypothesized here then that creativity has a positive influence on a person's life satisfaction.

### 1.4 Communication

Although there have not been many studies carried out on adolescents, research on life satisfaction with reference to this group is useful because of its relationship with certain indicators of psychosocial development, such as mental health, academic achievement, and social adjustment (Proctor *et al.* 2009). During this period of life, a person's life satisfaction seems to be especially positively related to his or her self-esteem, a positive view of the classroom environment, and parental support, and negatively related to symptoms of depression, stress, anxiety, negative attitudes about school and teachers, and aggressive behavior (Bendayan, Blanca, Fernández-Baena, Escobar and Trianes 2013, Valois, Zullig, Huebner and Drane 2009). Previous studies have also discussed and confirmed the importance of the environment of one's family (Ma and Huebner 2008, Proctor *et al.* 2009). As Proctor *et al.* (2009) have pointed out, it is important for teens' mental health to perceive support from parents and friends. Moreover, Ma and Huebner (2008) have argued that for young people, if bonding with parents takes place it will contribute to their positive development and subjective well-being, even more than peer bonding, according to them. The family environment not only provides support, it also helps adolescents develop resources and abilities that they can use later in a variety of social contexts.

The communication between parents and children has been examined as a family variable, but more can be done in this area, and the role of teens' communication has hardly been investigated in terms of enhancing their life satisfaction. Levin, Dallago, and Currie (2012) have addressed this issue and have indicated that the quality of the communication in the family has a strong impact on adolescents' life satisfaction, stronger than even the family



structure or financial resources. Additionally, the communication on the part of the parents with their adolescent children can have indirect effects, as good communication can increase their self-esteem and lessen their feeling of loneliness. This is so because they feel closer to their parents, and more valued and understood by them. Friends are also important of course in terms of adolescents' life satisfaction, but studies have shown that it is the family that plays the stronger role in this regard (in terms of self-esteem and loneliness). Further, both self-esteem and reduced feelings of loneliness have been seen to be connected with life satisfaction (Kong and You 2013, Proctor *et al.* 2009).

Furthermore, parental communication may affect adolescents' life satisfaction indirectly. Good communication can increase their self-esteem and decrease their feelings of loneliness, as they will feel closer, more valued, and better understood by their parents. Although friends are also important during adolescence, previous studies have shown the influence of the family on adolescents' self-esteem and lack of loneliness (Cava, Musitu, Buelga and Murgui 2010), and both have been seen to be closely related to life satisfaction.

In addition to the adolescents' relationships with their parents, their relationships with their classmates and teachers also have a strong connection with their life satisfaction, including being able to study in a positive classroom environment. In fact, studies have found a connection between adolescents' positive perceptions of the classroom environment and their feeling of satisfaction with their lives, including diminished feelings of loneliness and a higher degree of self-esteem (Oberle *et al.* 2011). The classroom environment in turn depends to a great extent on how the students see it and how they perceive the teacher/student relationship (Cava *et al.* 2010). There is also a parallel between the child/parent relationship and the child/teacher/classmate relationship—if the adolescents feel good in their families, this attitude can be transferred to the classroom setting, thus creating a more positive school atmosphere in general and better interpersonal relationships. Such a positive perception of the classroom environment and the adolescents' relationships with others can also lead to a reduction in their feelings of loneliness and promote their sense of belonging and self-esteem. It is hypothesized therefore that communication skills are positively related to adolescents' life satisfaction.

### 1.5 Collaboration

According to Morel (2014), the educational systems in the world today are struggling with a variety of issues, and among these is conveying to students the importance of communication skills and the ability to collaborate with others. It is no secret that people have always worked together in order to achieve common goals, but one can wonder why collaboration skills seem to be of even greater significance today. The following points address this issue.

- Our society has become more complex and global, and therefore more collaboration is required in the workplace

Not so long ago, people could live their entire lives having to collaborate with just a handful of people or perhaps a few more with whom they had developed relationships during their lives. Today, things are different; now the average person comes into contact with dozens and perhaps hundreds of people on a daily basis and this is largely thanks to the development of technology. It was just fifty years ago that most jobs required a person to get along with just a boss, a few coworkers, and some clients or customers—all of whom you would meet on a personal basis. However, because of the complexity of the modern world, customers and suppliers are now found anywhere in the world, competing with each other, and most jobs make it necessary to cooperate with multiple teams that cover professional, political, geographic, and linguistic boundaries, to mention just a few elements of today's communication—and all of the individuals on all of these teams contribute their individual work to the finished product or service.

- Collaboration requires deep learning if complex problems are to be identified and solved

Learning has always been a collaboration between teachers and students, and has always been based on a strong connection between the student and teacher. In fact, learning has always been connected with human relationships, beginning from when parents model speech for their babies. Engaging in meaningful relationships with others leads to intellectual growth, for example when we share ideas with others, defend our own point of view or adopt the point of view of another, provide or accept feedback from someone, and use our knowledge to achieve common goals. In the present age when critical thinking is so important, students must have the opportunity to develop these skills, and they must be able to accomplish this in today's challenging collaborative environment, as mentioned above.

- Collaboration is necessary for the functioning of democracy



Democracy can only survive if certain skills are cultivated that can be considered to be the basis of democracy: arguing for one's position, listening to the point of view of others, putting oneself in others' "shoes," learning to compromise, being able to forgive, and learning what it means to be truly humble - and it is in schools where students first encounter points of view that are radically different from those that they find largely in their families. It is therefore the job of the school to provide forums in which the skills mentioned above can be modeled, practiced, and perfected. The world today is much more active and diverse than it was in the past obviously, and it is therefore more important than ever that today's citizens learn how to collaborate with others so that they can exert as much positive change on their immediate surroundings as possible.

- Collaboration creates joy

Today, it is well known that social media, the Internet, and mobile technology are increasingly replacing face-to-face human contact, and teachers and students alike are experiencing the loneliness that stems from this lack of contact. However, teachers have reported that they experience greater job satisfaction when they engage in greater amounts of collaboration with their peers, and the same is true of students: those that feel that they belong have less likelihood of dropping out of school. Working and collaborating with others, whether it takes place online or face to face, can enhance a person's creativity, his/her ability to think, his/her respect for others, and promote the ability to work on a team—all of which can end in demonstrating to us skills that we did not know we had. It is hypothesized then that the skill of collaboration tends to have a positive influence on a person's life satisfaction.

### 1.6 Technological Skill

According to Choudhury and Barman (2014), innovation and development in the contemporary world of technology have changed our lives in many aspects, for example giving us the ability to transform our environment, extend the length of our lives, and to create interconnected global societies. Technology is used by all of us every day, from the simple hammer to computers that connect us with people on the other side of the world; and this technology has influenced nearly every aspect of our lives - from mobile phones to TV and micro-wave ovens, airplanes and so on. It can be seen then that technology plays an essential role in our lives while at the same time it forces us to face numerous key issues, as can be seen in the following:

- *Bridging the Gap*: Many people in the world do not have life's essentials, such as safe drinking water, electricity, good roads, or quality healthcare - and technology can improve these conditions in different ways, for example through better communication and education systems, and the building of industry, which can create employment and make sure that everyone has access to these life essentials. Taken from a macro-perspective, technology also has a strong impact on the enhancement of global trade and nations' economies.

- *Increasing the Online Community*: It is common knowledge that the people in the world today are connected through their use of social media. Indeed, the creation of media platforms such as Facebook, YouTube, and others has allowed people to create public profiles of themselves and to share their interests with others without having to travel thousands of miles to do so. This communication not only takes place between people that know each other but also among individuals that do not know each other but are bonded by common interests, for example.

- *Making Domestic Life Easier*: Technology is making a large contribution to our lives today in many ways, and one of these ways is in making our domestic lives easier, with the creation of such tools as home appliances and garden tools of a variety of kinds - all of which have made our lives more comfortable than even our parents experienced. This use of domestic technology applies of course to males and females as both today are involved in the chores around the house. It is interesting that for women, the introduction of technology into their home has made it possible for them to be released from the types of "hard" tasks that they had to perform in the past following traditional roles. It can be seen that the creation and use of technology have arisen to solve many of the daily problems that we encounter. It follows then that the skill in the use of technology is likely to be positively related to one's life satisfaction.

### 1.7 Social Responsibility

Responsibility is an essential characteristic of what makes humans human, and it can be defined as the ability, and right, to accept and respond to tasks while at the same time having the right to say no to the tasks that are rejected (Mousavi 1998). Cereto (1989) has suggested that responsibility is the internal desire of an individual to carry out all of the activities assigned to him or her. Various studies (Ali, Amorim and Chamorro-Premuzic 2009) have indicated that if one has empathy toward others, it leads to friendship, and contrariwise, if one does not possess

this empathy it can lead to ignorance. An empathic individual exhibits altruism and cooperation in his or her behavior and feelings; however, individuals that lack such an attitude do not value others and are concerned only about their own interests and ambitions (Latané, Norenzayan and Philbrick 2006). In fact, responsibility and empathy are deeply connected, as the experience of empathy leads to the development of responsibility; that is, assigning importance to others based on understanding their situations and feelings (Dovidio, Piliavin, Schroeder and Penner 2006). Further, responsibility is one of the main elements of altruism, *i.e.* the individual will see himself or herself as responsible for others and not be indifferent to them or their needs (Latane and Darley 1970). In this way, the internalization of responsibility reinforces the tendency to exhibit altruistic behavior while the lack of responsibility increases a person's indifference (Levine, Norenzayan and Philbrick 2001). It has been suggested that people that help others in their 30s are happier in their later years as compared to other individuals that do not exhibit such empathy (Dickert, Sagara and Slovic 2011). It can be seen from these studies then that the desire to help others and a person's belief in his or her ability to exert change are associated with increased happiness and personal satisfaction (Meyers 2004). It is hypothesized then that social responsibility has a positive impact on an individual's life satisfaction.

### 1.8 Nature Lover

Wilson (1984) has suggested that people have an inborn tendency to value their connection with other living things. This tendency has been called the biophilia hypothesis by Kellert and Wilson (1993), and this attraction to life and life's processes can be understood through the lens of an evolutionary perspective - humans have spent almost all of their evolutionary history in the natural environment and have only created urban living environments in relatively recent times, and it is thought that because of this past we have retained a need to connect with nature (Kellert and Wilson 1993). In the past, our perception of our connection with nature was necessary for survival, as we searched for food and used natural elements for housing and other essential needs. Those that were better connected thus would have been at an advantage. The gap between then and now is quite clear, and this gap seems to be growing, as for example many of our children now are spending less time in "natural" environments compared to the past (Clements 2004, Louv 2005, Natural England 2009) and, in general, individuals in the more developed countries are spending nearly all of their time indoors (Evans and McCoy 1998, MacKerron and Mourato 2013). In fact, for the first time in human history, much of the world's population is now living outside rural areas, attracted to cities for a variety of reasons, perhaps mostly economical (United Nations, Population Division 2002). This physical disconnection from nature can have a negative impact on our emotional well-being, as it has been asserted that exposure to nature is associated with increased happiness (Berman *et al.* 2008, 2012, Mayer *et al.* 2009, Nisbet and Zelenski 2011, MacKerron and Mourato 2013, White *et al.* 2013).

It has also been asserted that there are deep differences between those that feel a connection with nature and those that do not - differences in personality, attitudes, behavior, and well-being. Those that are seen to be more connected with nature seem to be more extraverted, agreeable, conscientious, and open (Nisbet *et al.* 2009, Tam 2013). A greater connection with nature has also been associated with attitudes that are pro-environment, including a greater desire to engage in sustainable actions and to possess concern about the negative effects of human behavior on the environment (Mayer and Frantz 2004, Leary *et al.* 2008, Nisbet *et al.* 2009, Tam 2013). In terms of behavior, people that feel that they are connected with nature have been seen to spend more time actually in nature, and engaged in various behaviors that support the protection and enhancement of the natural environment, for example buying "green" products (Mayer and Frantz 2004, Nisbet *et al.* 2009, Tam 2013). In terms of the present writing, one's perceived connection with nature can also be seen to be connected with one's satisfaction with life or psychological well-being (*e.g.*, Nisbet and Zelenski 2013). It is hypothesized then that being a "nature lover" is positively related to one's life satisfaction.

## 2. Methodology

### 2.1 Survey

The questionnaire was first pretested with a group of 17 MBA students at the National Institute of Development Administration. Then, personal interviews were conducted with seventeen randomly-sampled persons that were at least 18 years of age. The questionnaire was assessed in terms of its suitability, readability, and for possible ambiguity, and it was revised based on the feedback received from both groups. Then, five hundred and ten eligible respondents were interviewed in thirty-four department stores and discount stores spread over the Bangkok area. The response rate was 55%.

## 2.2 Data Analysis

In general, certain 21<sup>st</sup> century skills and human qualities are likely to have a positive impact on a person's life satisfaction, particularly problem-solving skills, critical thinking ability, creativity, communication skills, the ability to collaborate, technological skills, and also the "skill" of being socially responsible and being a nature lover. In order to investigate whether this hypothesis was true, a regression analysis was conducted. Specifically, the earlier-mentioned independent variables as well as the demographic characteristics, including gender, age, marital status, education, and household income, which were also used as the independent variables because they were used as the controllable variables, were regressed on life satisfaction, which was used as the dependent variable. Life satisfaction was measured using the Cantril ladder, where people are asked to place their lives on a ladder with ten rungs, with the top (tenth) rung being the best possible life and the bottom rung the worst.

It should be noted that education was divided into low education, consisting of people with lower than a bachelor's degree, and high education, consisting of those with at least a bachelor's degree. Household income was also divided into two groups: the low household income group was comprised of persons that earned less than 60,000 baht/month (1 US\$ = 33 baht at time of writing), whereas the high household income group was comprised of those that earned at least 60,000 baht/month.

## 3. Results and Discussion

The results of the multiple regression analysis are shown in Table 1.

Table 1. Results of multiple regression of life satisfaction on its determinants

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.868	.680		2.748	.006		
Problem solving	.109	.062	.106	1.764	.078*	.420	2.379
Critical thinking	.160	.059	.158	2.718	.007*	.450	2.222
Creativity	.038	.050	.041	.754	.451	.516	1.937
Communication	.096	.058	.097	1.649	.100*	.440	2.274
Collaboration	.080	.060	.080	1.342	.180	.433	2.308
Technological skill	.076	.042	.083	1.784	.075*	.698	1.432
Social responsibility	.035	.053	.036	.653	.514	.514	1.947
Nature lover	.036	.043	.043	.841	.401	.594	1.684
Gender	.093	.115	.032	.806	.421	.947	1.056
Age	.019	.007	.153	2.988	.003*	.579	1.728
Marry group	-.149	.155	-.047	-.956	.339	.627	1.594
Educ group	-.044	.139	-.013	-.318	.750	.887	1.128
Inc group	.216	.120	.073	1.804	.072*	.922	1.085

Note:  $R^2 = .29$      $\bar{R}^2 = .27$      $F_{13,496} = 14.50$      $P = .000$     \* = Significant at  $\alpha \leq .1$

Taken together, the 13 independent variables accounted for 29% of the variance in life satisfaction ( $R$ -square = .29). In addition, the skills of problem-solving, critical thinking, communication, the technological skill, age, and household income were seen to have a positive impact on life satisfaction. According to the standardized beta coefficients, the skill of critical thinking and age tended to be the most influential on life satisfaction, followed by the skills of problem-solving, communication, the technological skill, and household income. It should also be noted that multicollinearity was not a likely problem because the magnitude of the variance inflation factors associated with each independent variable was far less than ten (Wetherill *et al.* 1986).

For the whole population, along with the standardized beta coefficient of the significant independent variables in the regression analysis, the mean values for the perceived performance of the independent variables are presented in Table 2. The mean values were taken from ten-point anchoring scales, ranging from 1, meaning very little, to 10, meaning very much.

Table 2. Importance and performance of the determinants of life satisfaction for the whole population

	Standardized Beta	Mean
Critical thinking	0.158	7.28
Age	0.153	NA
Problem-solving	0.106	7.39
Communication	0.097	7.58
Technological skill	0.083	7.25
Inc group	0.073	NA

According to the importance-performance table (Table 2), critical thinking had the most important influence on life satisfaction, but it was more or less the least performer. These results suggest that in promoting life satisfaction for the general public, the development of critical thinking, problem-solving, technological skills, and communication should be encouraged; and the focus of advancement should be placed most on critical thinking.

It was noteworthy that age and household income were seen to have a positive influence on life satisfaction. This means that people that are at least 30 years old are more satisfied with their lives than those that are 18 to 29 years old. In addition, those with a household income of at least 60,000 baht/month were seen to be happier than those that had a lower household income. Therefore, further similar analyses with the entire population by using regression and descriptive statistics were carried out with the younger versus the older-age group, as well as with the lower household income versus the higher household income group. Along with the standardized beta coefficient of the significant independent variables in the regression analysis, the mean values for the perceived performance of the independent variables of people at a younger age, an older age, and those with a lower household income and a higher household income are presented in Tables 3, 4, 5, and 6 respectively.

Table 3. Importance and performance of the determinants of life satisfaction in the young group

	Standardized Beta	Mean (Young)	Mean (Old)	t-test
Communication	0.203	7.52	7.65	NS
Creativity	0.164	7.28	7.24	NS
Social responsibility	-0.155	7.94	7.99	NS
Educ group	0.112	NA	NA	NA

Note: NS = Not significant      NA = Not applicable

Table 4. Importance and performance of the determinants of life satisfaction in the older group

	Standardized Beta	Mean (Old)	Mean (Young)	t-test
Critical thinking	0.213	7.34	7.23	NS
Social responsibility	0.190	7.99	7.94	NS
Problem-solving	0.185	7.54	7.27	S (.02)
Educ group	-0.121	NA	NA	NA

Note: NS = Not significant      S = Significant      NA = Not applicable

Table 5. Importance and performance of the determinants of life satisfaction in the low household income group

	Standardized Beta	Mean (Low income)	Mean (High income)	t-test
Critical thinking	0.324	7.23	7.31	NS
Age	0.160	NA	NA	NA
Communication	0.147	7.44	7.66	NS

Note: NS = Not significant      NA = Not applicable

Table 6. Importance and performance of the determinants of life satisfaction in the high household income group

	Standardized Beta	Mean (High income)	Mean (Low income)	t-test
Technological skill	0.155	7.22	7.31	NS
Age	0.143	NA	NA	NA
Problem-solving	0.132	7.41	7.36	NS

Note: NS = Not significant      NA = Not applicable

Taking the results of Table 3, 4, 5, and 6 together, it can be seen that the critical thinking skill should be promoted with the older group, as well as the lower household income group, because this skill is highly valued but under-performed as compared to other skills in these groups. For the same reason, the technological skill should be developed with the higher household income group. It is noteworthy that the characteristic of social responsibility

was relatively high in both the younger and older groups but it was negatively related to life satisfaction in the younger group, whereas it was positively related to life satisfaction in the older group. It may be that the young tend to view social responsibility as a burden in their lives while older individuals are likely to perceive it as a “joy maker.” It follows that the younger people’s mindset should be changed in order to make their lives happier while they already contribute relatively highly to the society. It should also be noted that problem-solving was the only important skill that was significantly different between the age groups and household income groups. Specifically, older individuals were seen to have much better problem-solving skills than the young. Therefore, it would be good if we can seek contributions from older-age people in helping us to solve the problems around us in order to better other people’s lives as well as their own.

## Conclusion

Critical thinking, problem-solving, communication, and technological skills - as well as age and household income - have a positive impact on life satisfaction. Critical thinking is likely to be the most desirable skill for promotion because it is good for the future success of persons as well as for their happiness. To be more specific, the promotion of the critical thinking skill should be targeted at older individuals and at the low household income groups. In addition, the technological skill should be developed among the high household income group. Furthermore, in order to make younger people happier, changes in how they value social responsibility from negative to positive should be encouraged. Lastly, the strength of the problem-solving skill of older people should not be overlooked—in fact, it should be used to better everyone’s life.

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## The Impact of Lifelong Learning on the Country's Development in Dimension of Innovative Oriented Economy: Comparative Analysis

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### Abstract:

Under the conditions of knowledge-based economy and under influence of the 4th Industrial Revolution education has become a strategic factor of social development and achieving of this goal will be possible only through the population's involving the lifelong learning.

The purpose of this paper is to determine the dependence between competitiveness of any country and level of its lifelong learning under conditions of development knowledge-based economy. Particular actuality is associated with necessity of the lifelong learning in the process of working in dimension of innovative oriented economy. The study covers the relationship between the level of lifelong learning and level of the country's development, the impact of lifelong learning on it. As a result, it was defined, between competitiveness and level of lifelong learning exists a close relationship. The matrix shows the 4 groups of countries with different levels of competitiveness and lifelong learning. The achieved results of created matrix suggest that the instruments of Nordic model of lifelong learning is the most effective, as the results, these countries.

**Keywords** higher education; lifelong learning; knowledge-based economy; 4th Industrial Revolution; innovative oriented economy

**JEL Classification:** A23; D83; I23; O10; O47

### Introduction

The emergence of the global innovative oriented economy, where the center is has put a premium on learning throughout the world. Ideas and know-how as sources of economic growth and development, along with the application of new technologies, have important implications for how people learn and apply knowledge throughout their lives.

Now, the key four pillars of the knowledge based economy are:

- 1) economic institutional regime, which provides incentives for the efficient creation, dissemination, and use of existing knowledge;
- 2) education through an educated and skilled population that can use knowledge more effectively;

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- 3) information infrastructure to facilitate the effective communication, dissemination, and processing of information;
- 4) innovation consisting of organizations that can tap into the stock of global knowledge, assimilate and adapt it and create local knowledge.

This changes the role of universities, in particular, not just to train high level human manpower, but in context of knowledge based economy, which are now increasing critical, also as generators and disseminators of knowledge: R&D, Spin-off of high tech firms, Licensing of technology, Contract research with firms and public research, Consulting services.

The universities are also becoming important players in helping develop national competitiveness and development strategies. But under these conditions at the very center of what developing countries have to do to improve their prospects are improving access and quality of education; retraining and lifelong learning.

Thus, under conditions of the acceleration of updating the knowledge, the requirements of society are increasing to the quality of vocational education, constantly technology of training are updating, economic conditions are changing, in which the higher educational institutions work, exacerbated by competition on the market of educational and scientific services, the position of the state is changing to the higher education.

The scientists observed this trend: the more educated person, the more it needs to constantly update its knowledge. This explains the desire for career growth and demand for such employees, improve mobility, increase wages and personal motivation to develop. So, in a knowledge based economy education has become a strategic factor of social development and achieving this goal is seen as lifelong learning.

Lifelong learning is becoming a necessity in many countries. It is more than just education and training beyond formal schooling. A lifelong learning framework encompasses learning throughout the lifecycle, from early childhood to retirement, and in different learning environments, formal, nonformal, and informal. Opportunities for learning throughout one's lifetime are becoming increasingly critical for countries to be competitive in the global knowledge economy.

Lifelong learning is education for the knowledge economy. Within this lifelong learning framework, formal education structures - primary, secondary, higher, vocational, and so on—are less important than learning and meeting learners' needs (Lifelong Learning in the Global Knowledge Economy: Challenges for Developing Countries. The International Bank for Reconstruction and Development / The World Bank).

### **1. The idea of lifelong learning: Literature review**

The idea of lifelong learning is a new educational reality, which should be continued for the whole of your life. This idea is based on the emerging information society. Lifelong learning is not a new idea because in 1926 Eduard Lindeman had developed the main arguments in the meaning of adult education (Marcinkiewicz 2011).

Lifelong Learning has become the key leitmotif of education policy at the turn of the new Millennium (EC 2000, OECD 1996, UNESCO 1996). As a new and near-universal meta-discourse of policy, it seeks to address the secular trends which in all countries place heavy new demands on education, including those of demographic ageing, increasing cultural pluralism and social diversity and, not least, of the rise of the knowledge-based economy (Green 2003, OECD 1996). Within Europe, it has been charged with a major role in achieving the Lisbon Summit goals of making Europe the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion. In other words, Lifelong Learning is seen as crucial for the realization of the so-called Knowledge Economy. However, there are many different visions and models of Lifelong Learning, just as there are many different visions of the Knowledge Economy. The main hypothesis of this paper,

The purpose of the paper is to determine the dependence between competitiveness of any country and level of its lifelong learning under conditions of development knowledge-based economy. Especially, this issue is actual on the stage of strengthening of integration of components of Triple Helix, which impacts on the possibility of creating innovative-integrated structures. In this paper, we try to answer the following questions:

- What are the modern trends in Higher Educational Space in comparison with different countries?
- Why the lifelong learning is needed in current environment of knowledge-based economy?
- The correlation-regression analysis between Competitiveness of countries and level of lifelong learning and the possibility of modeling a matrix.

### **2. Research Results**

A knowledge-based economy relies primarily on the use of ideas rather than physical abilities and on the application of technology rather than the transformation of raw materials or the exploitation of cheap labor. It is an economy in

which knowledge is created, acquired, transmitted, and used more effectively by individuals, enterprises, organizations, and communities to promote economic and social development (World Bank Institute 2001c, World Bank 1998d). Knowledge can either be codified and written down or tacit and in people's heads.

The knowledge-based economy is transforming the demands of the labor market in economies throughout the world. But the ways for each country are not similar. Besides, the features and challenges of the knowledge at such society are being changing. The new trends include the following. In addition, the Table 1 shows how these trends are inherent to some countries.

Table 1. Characteristics of trends of higher education under conditions of knowledge-based economy in different countries

Trends	World	Ukraine	Poland	Czech Republic	Austria	Germany	USA	Norway	UK
Higher enrollment rates, especially in higher education	+	-	+	-	-	+	+	+	+
Older students in higher education	+	+	+	+	-	+	-	-	-
More participation of workers in continuing education	+	-	+	+	+	+	+	+	+
Growing need for training in ICT skills	+	+	+	+	+	+	+	+	+
Internationalization of higher education and training	+	-	+	+	+	+	+	+	+
Increasing private provision of education and training	+	-	-	+	+	+	+	+	+

Source: constructed by the author in accordance with Appendix 1.

The process of preparing employees to compete in the knowledge economy requires a new model of education and training, a model of lifelong learning. A lifelong learning framework encompasses learning throughout the life cycle, from early childhood to retirement. It includes formal, nonformal, and informal education and training. Formal education and training includes structured programs that are recognized by the formal education system and lead to approved certificates. Nonformal education and training includes structured programs that are not formally recognized by the national system. Examples include apprenticeship training programs and structured on-the-job training. Informal education and training includes unstructured learning, which can take place almost anywhere, including the home, community, or workplace. It includes unstructured on-the-job training, the most common form of workplace learning.

So, lifelong learning is crucial in enabling employees to compete in the global economy. As we can see at Table 2, the current society is changing the role of education, the direction and the relationship between participants of the educational process and expanding its capabilities. The traditional learning model differs from lifelong learning methods in important ways.

Table 2. The comparative characteristic of traditional and lifelong learning

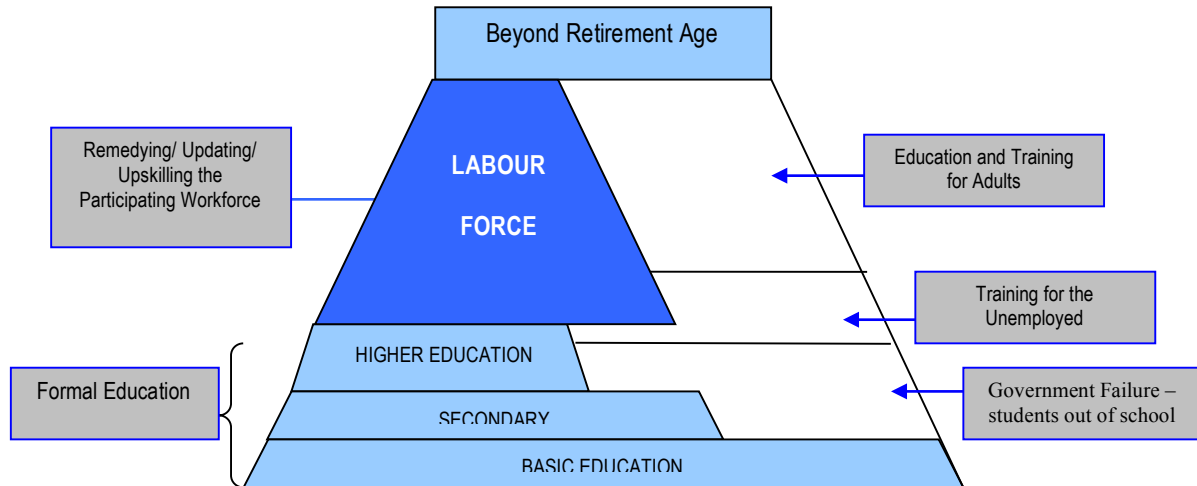
Traditional learning	Lifelong learning
The teacher is the source of knowledge	Educators are guides to sources of knowledge
Learners receive knowledge from the teacher	People learn by doing
Learners work by themselves	People learn in groups and from one another
Tests are given to prevent progress until students have completely mastered a set of skills and to ration access to further learning	Assessment is used to guide learning strategies and identify pathways for future learning
All learners do the same thing	Educators develop individualized learning plans.
Teachers receive initial training plus ad hoc in-service training	Educators are lifelong learners. Initial training and ongoing professional development are linked.
Good" learners are identified and permitted to continue their education	People have access to learning opportunities over a lifetime
The teacher is the source of knowledge	Educators are guides to sources of knowledge

Source: constructed by the author in accordance to the World Bank.



As we see, lifelong learning is more effective decision by ways of obtaining. It's not only educational process at different types of educational institutions, also process anyway and the main – the understanding the need of lifelong learning and desire of receiving. The need for the emergence of lifelong learning we can see in the picture below. Formal education is not able to cover all population of the world throughout their life, it can give some basics skills, abilities and competencies, on base of which a person can continue their professional development.

Figure 1. The necessity in lifelong learning



Source: Authors' own elaboration.

We must affirm, that education helps reduce poverty; if developing countries do not promote lifelong learning opportunities, the skills and technology gap between them and industrial countries will continue to grow.

During this (from 1970's) time, manufacturing began to be shifted into less developed countries to cut production and labour costs at the same time as overseas markets were explored for the export of products. The idea of a 'world economy' became more commonplace, and communication systems expanded with the evolution of electronic technology. In the West, there was an increased demand for skilled labour in what became known as a 'knowledge economy', leading to an interest in generating a more educated workforce (Gouthro 2017).

In the knowledge economy, there can be no doubt that for the individual, continuing to learn, whether by formal or non-formal means, is the key to gaining employment and income stability. The longer one has engaged in formal education and training as reflected in one's skills and qualifications, the higher one's income and the more likely one is to be employed (Power and Maclean 2011). This issue turns out the main reason that well educated and trained individuals earn higher incomes is that they have higher knowledge and skill levels, that is, higher qualifications are simply a proxy for more skills (Maclean and Wilson 2009).

Learning throughout life leads to improved human capital and labor productivity, and this in turn is the major contributor to economic development (Banks 2008). Thus, at present, the main tool of the general evaluation of the competitiveness of countries is the Global Competitiveness Index, which is compiled of 113 variables that detail the competitiveness of the countries of the world. It was this indicator that we defined as the main resultant the economic development of the countries of the world.

To quantify the strength of the relationship, we can calculate the correlation coefficient. In algebraic notation, if we have two variables  $x$  and  $y$ , and the data take the form of  $n$  pairs, then the correlation coefficient is given by the following equation:

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}}$$

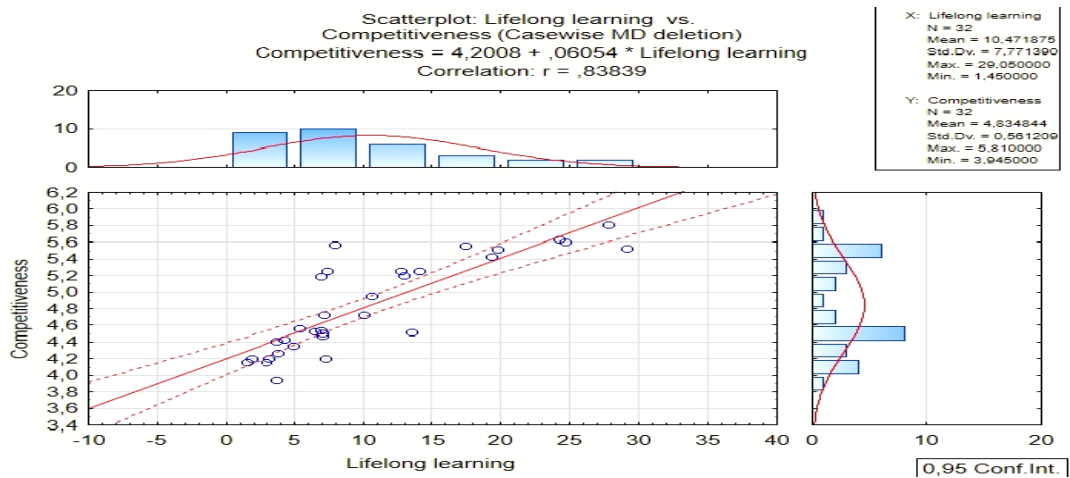
where:  $\bar{x}$  is the mean of the  $x$  values, and  $\bar{y}$  is the mean of the  $y$  values.

This is the product moment correlation coefficient (or Pearson correlation coefficient). The value of  $r$  always lies between  $-1$  and  $+1$ . A value of the correlation coefficient closes to  $+1$  indicates a strong positive linear relationship (*i.e.* one variable increases with the other). Further, according to our hypothesis, calculate the degree



of relationship Competitiveness and Lifelong learning, taking into account the indicators of countries of EU in dynamic (2006 and 2016).

Figure 2. The ratio of correlation between *Competitiveness* and *Lifelong learning*



Source: Authors' own elaboration (date of release: 2016 EU, The Global Competitiveness Report 2016).

A correlation coefficient shows the degree of linear dependence of  $x$  and  $y$ . In other words, the coefficient shows how close two variables lie along a line. In our occasion,  $y$  (*competitiveness*) is dependent variable and  $x$  (*lifelong learning*) - independent variable. The relationship between *competitiveness* and *lifelong learning* depicted in Figure 2 has a really high correlation of 0.83.

Besides, we consider, that the modelling of regression model can be useful in process of our analysis. The purpose of regression analysis is to analyze relationships among variables (in our analysis - *Competitiveness* and *Lifelong learning*), where the results serve the following two purposes: a) answer the question of how much  $y$  changes with changes in each of the  $x$ 's ( $x_1, x_2, \dots, x_k$ ), and b) Forecast or predict the value of  $y$  based on the values of the  $X$ 's.

```
Call:
lm(formula = form, data = data)
Residuals:
    Min       1Q   Median       3Q      Max
-0.56749 -0.18197 -0.04802  0.10044  0.89950
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  4.263344  0.104574   40.77 < 2e-16 ***
LLL          0.048471  0.007246    6.69  2.45e-07 ***
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 0.3422 on 29 degrees of freedom
Multiple R-squared:  0.6068, Adjusted R-squared:  0.5932
F-statistic: 44.75 on 1 and 29 DF, p-value: 2.448e-07
```

Statistic significance of the model:

H0: model is not statistically significant                      H1: model is statistically significant

p-value:  $2.448e-07 < 0.05$  we reject null hypothesis and we approve alternative hypothesis that model is significant. This model describes 59,32% of variability of dependent variable (*Competitiveness*)

Statistic significance of the variables:

H0: variable is not statistically significant                      H1: variable is statistically significant

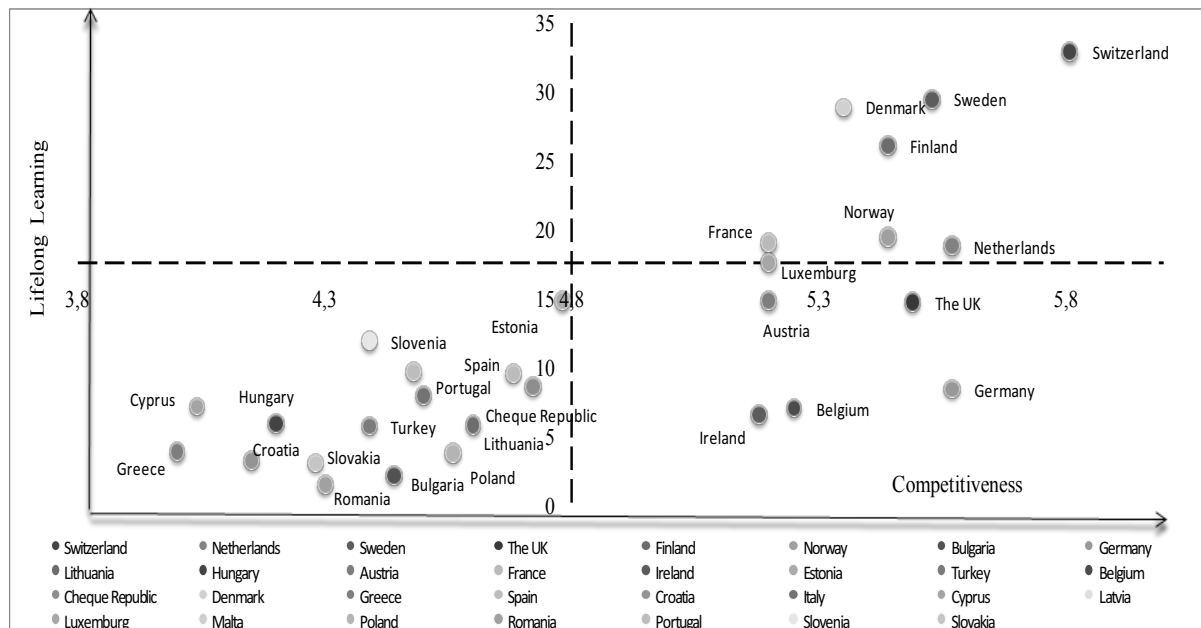
p-values:  $2.45e-07 < 0.05$  (LLL) we reject null hypothesis for both variables and we approve alternative hypothesis that variable *lifelong learning* is significant.

Interpretation the results:

Ceteris paribus: if the *lifelong learning* (level of its) will increase by 1% then competitiveness of country will increase by 0.048% ~ 0.05 %.

Next, we consider it necessary to group countries in a matrix, which consists of indicators for the competitiveness of countries and level of lifelong learning (Figure 3).

Figure 3. Matrix of competitiveness and lifelong learning of European countries



Source: Authors' own elaboration [date of release: 2016 EU, The Global Competitiveness Report 2016].

As are shown in the matrix (Figure 3), to the countries, which located on the "stars" position of Matrix, include the following: Switzerland, Sweden, Denmark, Finland, Norway, France, Netherlands, Luxembourg. They are characterized by a high rate of lifelong learning, as evidenced by an increasing in the trend towards *lifelong learning* and the majority of the high rate of competitiveness.

To verify the availability of the direct relationship between the level of wages in these countries and indicators of lifelong learning and competitiveness, we are analysing, these indicators of the top countries and outsiders, for example, the minimum wage in Switzerland consists of 5.716,65 Euros and accordingly, involving in *lifelong learning* - 32,9%, in Denmark - 5.064,53 euros and 28,9% of *lifelong learning*, Norway - 4.557 euro and 19,5%, while in Croatia - 782,86 euros, and *lifelong learning* - 3,2%, in Poland - EUR 453, *lifelong learning* - 3,7%, in Romania - 275 euros and 1,4% of *lifelong learning*.

So, through the made comparative analysis, we found the following conclusion, that the greater level of coverage of lifelong learning, the higher rate and the competitiveness of the country's population is financially secured, as evidenced wages. Instead, Ukraine, salaries are comparatively low, namely 122 euros in 2012 and 110 euros in 2017, which in 10 times less than in developed countries. Concerning the process of involving of lifelong learning in Ukraine - insignificant. Issue of lifelong learning is actual in whole world and the attention to its is increasing each year. But, unfortunately, not in Ukraine. As the evidence, the quantity of searching in this field in the world Internet search engines: *lifelong learning* - 174000000, professional development training - 156000000 and human development - 54400000 and, for example, the same words in Ukrainian Internet search engines, in Ukrainian or Russian language - 2400000, 636000 and human development - 1890000, which underlines about the lack of interest from the side of searcher of information, ie lack of motivation to teach the essence "lifelong learning". This can be explained by the lack of a clear relationship between wages and educational levels, ie value added in wages, which makes de-motivation to involve of process of lifelong learning.

## Conclusion

In the paper we demonstrate that the dissemination of process of lifelong learning is one of the trends inherent in the evolutionary stage of the educational space and the strengthening of the competitiveness of the economies of the world, because, in terms of process of clustering, as a form of innovative restructuring at current stage of development of global economy, it is an extremely important aspect of the quality of the workforce. Of course, as we defined, between competitiveness and level of lifelong learning exists a close relationship. The matrix shows the 4 groups of countries with different levels of competitiveness and lifelong learning. The achieved results of

created matrix suggest that the instruments of Nordic model of lifelong learning is the most effective, as the results, these countries.

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## Appendices

Appendix 1

Countries	Indicators													
	Higher enrollment rates, especially in higher education* (GCI)		Percentage of adults who have attained tertiary education, by_type_of_programme_and_age_group* (Ed. at Glance)		More participation of workers in continuing education (GCI)		Networked Readiness Index* (GIT)		Networked Readiness Index* (GIT)		Increasing private provision of education and training. 2004/2016 (Eurostat)			
	2006	2016	2006	2016	2006	2016	2006	2016	2008	2014	pub	pr	pub	Pr
Ukraine	14	11	12399**	25781	75	804,1	N/A	64	N/A	N/A	N/A	N/A	N/A	N/A
Poland	21	25	18	27,7	58	3,7	13	42	m	1,2	71,4	28,6	72	28
Czech Republic	38	32	14	22,1	34	8,6	16	36	5,1	3,1	95,3	4,7	87	13
Austria	32	15	18	30,5	17	14,8		20	12	4,2	90,3	9,7***	84	16
Germany	32	35	24	27,6	16	8,4	28	15	m	4,5	100	a	92	8
The United States	4	5	39	45	7	N/A	17	5	3,3	0,3	73,6	26,4	72	28
Norway	5	21	N/A	43	10	N/A	100	4	1,9	N/A	86,2	13,8***	83	17
The United Kingdom	23	36	N/A	43,4	9	14,7	N/A	8	14,1	1,5	a	100***	a	100

Source: Authors' own elaboration (The Global Competitiveness Report 2016, Education at a Glance, The Global Information Technology Report, Educational expenditure statistics – Eurostat)

## Conditions and Problems of Integration of Higher Educational Institutions and Business: An Outward Glance

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### Abstract:

In the article had considered analysis of the priorities of country's economy with the development of conditions for its solution at a critical moment, which is experiencing Kazakhstan.

Instability of market conditions and global crises in recent years have exposed the risks of dependence on natural resources and confirmed the need for economic diversification.

It had realized that prices for natural resources had reduced. If the financial condition of the country depends on the price of oil, then it is possible to get out of this circle only if the state diversifies the economy. Today, the country faces an important issue of joining the 30 countries of the world and one of the ways in solving this issue will be a qualitative improvement of human capital. Therefore, the main priority of Kazakhstan is the development and improvement of higher and professional education system.

At the same time, to identify and structure the needs of employers in the services of universities, to clarify the nature of motivation and the degree of satisfaction, intentions and wishes of top managers of the company regarding the training of young specialists by higher education institutions. There was used a sociological survey to conduct the research.

**Keywords:** higher education; business; integration; partnership

**JEL Classification:** I23; I25; I26

### Introduction

After gaining independence, Kazakhstan implemented the most radical format of higher education reform among the CIS countries. The system of higher education in Kazakhstan takes a special place in solving the problem of diversifying the country's economy. Over the past ten years, Kazakhstan has made significant progress. At the same time, significant measures are required in order to develop professional skills of young professionals that meet the requirements of labor market and development of science and innovation as the main driver of economic growth. In the structure of higher education of Kazakhstan private higher education institutions number is high (89 out of 127 or 70% of the total number of higher educational institutions). However, the leading, largest higher educational institutions remain in state ownership.

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Kazakhstan higher school faces serious problems in connection with demographic trends. The number of students decreasing over time is associated with low birth rates, which characterize the transition period after Kazakhstan's independence, the reduction in the number of applications for admission to correspondence courses and educational migration. The number of school leavers, *i.e.* potential applicants dropped from 191 thousand in 2006 to 138 thousand in 2017. The share of enrolled in higher education in Kazakhstan now makes about 48%. Nevertheless, over the past ten years, the absolute number of students entering universities (including after finishing technical and vocational education) decreased by 36%. The reduction in the number of young people of senior school and university age will continue according to demographers forecast even in 2018 - 2019.

## **1. Research Background**

The issue of mutually beneficial cooperation between higher educational institutions and enterprises is being active researched in the West countries since the beginning of the 1980s. Western scientists conducted a series of studies aimed at studying the relationship of universities and companies to bilateral cooperation. For example, Guerrero (2015), Goddard and Chatterton (2014), Slaughter and Rhoads (2015), and others studied the matter. The research results showed that higher educational institutions were under pressure from the government and social forces and were made actively promote social and economic development of their regions and play an important role in the national and regional levels of innovation ecosystem. In this regard, in addition to fulfilling educational and research functions, universities had to master the function of knowledge transfer. This implies the transfer and acquisition of knowledge through business community. The research results showed that business community mainly regards higher educational institutions as a source of man power which are not capable to conduct scientific research without financial investment from the state.

One of the studies conducted by Russian scientists confirms that the improvement of the personnel of enterprises is of particular importance for business, which contributes to the development of its competitiveness (Melnik and Pavlin 2014). The desire to reduce the cost of maintaining their own educational centers, the system of adaptation of the young worker to work in the enterprise, as well as obtaining additional resources for the innovation activity of teams of organizations.

One of the latest studies was carried out in the form of survey conducted in EMCOSU countries (Bulgaria, Hungary, Poland, Slovenia, Spain) with participation of Russia (Petrozavodsk State University) in 2014, within the established consortium of universities, and in other European countries (not entering EMCOSU). During the research, it has been found that the most widespread models of interaction are mobility of students, research and development, curriculum development, adults' education, mobility of scientists. Employers of all countries participating in the survey noted an importance and need for interaction with universities, the search for ways to establish mutually beneficial relations. However, bureaucracy was the main obstacle for cooperation in three EMCOSU countries, namely: in Hungary, Slovenia and Spain. Bureaucracy takes a long time, but a rapidly changing labor market cannot afford it. The study of Russian scientists there were participated 100 experts from universities and enterprises of the Northwestern region of the Russian Federation. The task was to determine the degree of cooperation objectives importance by the partners and assessment of partners' satisfaction with cooperation it was revealed that the parties were interested in continuing and expanding cooperation in all areas: training, employment of graduates, science and innovation. However, the priority direction of expanding cooperation for higher educational institutions was science and innovation (more than 90% of higher educational institutions), and for enterprises - training and employment of graduates (more than 75% of enterprises).

Obstacles to partnership and cooperation between universities and business had also considered in OECD work. It had noted that the relationship between higher educational institutions and industry is developing in some areas, however the level of credibility, as a rule, is low, that is a big obstacle leads to decline in quality of educational process, practical training of future specialists, lack of demand for young professionals and its isolation from reality. There are no mechanisms for employing graduates, attracting employers to the process of creating higher education standards, training and certification of specialists.

The scientists of Scientific and educational fund "Aspandau" said: "Despite existence of positive, especially quantitative estimates of educational achievements of the Republic of Kazakhstan, when compared with the world level the obvious fact is that within the last 15-20 years there has been a steady tendency of degradation of Kazakhstani system of education and science according to qualitative characteristics". They pay attention to the fact that "many branches of natural and technical researches have come to desolation, and scales and depth of humanitarian and social ones have drastically decreased."

In recent years, many problems have accumulated in scientific environment of the country: there are no effective mechanisms for material incentives in scientific activity; low social status of scientists who are not



interested in raising their professional level; aging of scientific personnel and their outflow to other areas of activity. This is not a complete list of "pressure points". The situation has aggravated by insufficient financing of scientific activities by the state. Many universities do not have conditions for qualitative training of specialists, since the existing financing system has not considered to upgrade expensive equipment. Overcoming it through increasing budgetary financing is unreal and futile, whereas to overcome backlog in equipping with technics and technology is necessary to develop partnerships with higher educational institutions, especially foreign companies. It has to be noted, that the costs on education in the countries focused on leadership are growing at a high rate. In the World Declaration on Higher Education for the 21st century, it has emphasized that without adequate higher education and modern research institutions creating critical mass of qualified and educated people no country is able to provide real sustainable development.

## 2. Methodology

According to the National rating the best universities in 2017: state universities such as the Kazakh National University named after Al-Farabi, Eurasian National University named after L. Gumilev, South Kazakhstan State University named after M. Auezov, Karaganda State University named after academician E. Buketov, Pavlodar State University named after S. Toraigyrov are the leading positions in rating tables.

As the result of the government's policy of optimizing the structure of higher educational institutions, in particular by tightening the requirements for licensing educational activities, in recent years there has been a tendency of reducing the number of higher educational institutions. From 2001 to the present, this number has decreased from 182 to 127. But the process of reducing the number of universities will continue, because in the world's leading countries in the field of education, in Britain there are 89 universities with population of 60.4 million, in Finland there are 20 universities for 5.2 million, in the Czech Republic with 10.2 million people there are 66 universities etc. On average, in the countries of East Asia, Europe, Russia and the West, with the number of population from 150 thousand to 700 thousand people there is one university. Among higher educational institutions of Kazakhstan 85 are positioned as universities, 21 as academies, 18 as institutes, and one as a conservatory. There is one independent university in Kazakhstan. President of Kazakhstan Nursultan Nazarbayev founded the Nazarbayev University in 2010, defining its role as a world-class university with strong research program.

Complication of demographic situation causes contradictory processes in the development of higher education. On the one hand, the shortage of consumers in the educational market encourages universities to recruit students at any cost, which leads to reduction in requirements for applicants and unfair competition. This trend is also observed in other developing countries, such as Thailand. According to Armond Sakvoravich, a professor at the National Institute of Development Administration, some universities in Thailand are so desperate to recruit students that they provide iPads for recruits or give discounts for training those students who persuade a friend to register. "The competition to get to the university in Thailand right now is approaching to zero. With poor input quality, how can universities produce high-quality graduates? At present, Thai universities compete in marketing strategies to attract students, not the quality of education," - he says. This trend has observed in our country as well. In order to attract students some universities in our country provide discounts on training, reduce prices for training, thereby dumping the prices of other universities, etc.

On the other hand, reduction in the number of universities and students could lead to increase in the quality of education. Another challenge for the universities of Kazakhstan is that every year the number of youth going abroad grows; the mobile youth begins to investigate new directions for receiving higher education abroad. "73 thousand Kazakhstani youth studied in Russia at all courses and 12 thousand studied in China last year. 85 thousand students study in two states Russia and China without accounting the students in Europe and other countries of the world, the USA, Turkey. More than 100,000 students study abroad." Such figures have given by the president of Association of higher educational institutions of RK Rahman Alshanov during the interview with correspondent of today.kz. This tendency has observed also in Central Asia where the most mobile young population lives, the statistics shows the steady growth in the number of students studying abroad. This group has grown from 67.300 students in 2003 to 156.600 in 2012, with surpassing mobility coefficient more than twice from 3,5% to 7,5%. These figures indicate that local higher educational institutions are not keeping pace with the growing demand for higher education. In 2012, five "host" countries accounted for almost half of the total mobile student population: United States received 18% of international students, the United Kingdom (11%), France (7%), Australia (6 %), Germany (5%).

The reason for selection of foreign higher educational institutions by applicants are:

- prestige and quality of foreign higher educational institutions;
- broadening of outlook and increasing chances to find a job;

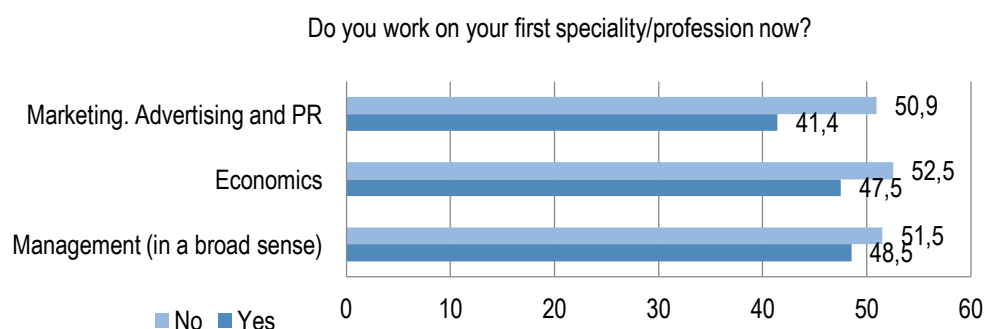
- access to higher education;
- practice-oriented training, teaching is conducted in an interactive style;
- more access to programs on specialization and additional related professions, the use of universities of the "major-minor" system, which increases the chance of employment among University graduates.

Table 1. Statistics of Kazakhstan citizens studying abroad

Direction	Students
Russia	48,875
Kyrgyzstan	35,106
USA	4,357
Great Britain	1,884
Czech Republic	1,725
Germany	1,174
Malaysia	695
Poland	401
UAE	361

Source: compiled according to the source [https://www.unipage.net/ru/student\\_statistics](https://www.unipage.net/ru/student_statistics)

Thus, recently there has been an increase in competition of local universities with foreign universities for applicants' attention. However, unfortunately local higher educational institutions much more concede on perfectly equipped audiences, scientific and practical complexes, material and technical resources and other strengths of foreign higher educational institutions. The sociological survey conducted among employers of Kazakhstan confirms this statement, for example 44,5% of employers haven't been satisfied with the level of graduates' training in educational institutions in Kazakhstan. 18% said that they do not meet modern requirements, needs of the economy. That is, this indicates that 63% of employers in principle are not satisfied with the level of our graduates' training. Experts of higher education say that in general higher educational institutions do not cope with the problem of improving the quality of education. Thus, the number of students in high schools in Kazakhstan is falling rapidly. Solvent parents send their children abroad to get quality education, as grants for talented youth had provided in foreign countries. It involves leakage of qualitative human capital, which in the future after receiving education remain in the country where they received higher education. The Minister of Education E. Sagadiyev, and other leading scientists of the country mention this problem. The research carried out by Bissam Central Asia in 2012 also demonstrates that graduates of high schools specializing in "information technology" experience difficulties in finding employment after graduating from the university. Nearly half of respondents of the specified specialties do not work on their first specialty they received. The greatest share of graduates does not work on the specialty among those them who have got basic education in such specialties as marketing, advertising and PR, information technology, and economics.



Source: Complex research of Kazakhstan companies' requirements in hr-consulting, key problems of hr-managers and the image of employers in Kazakhstan's public opinion. Center for Business Information, Sociological and Marketing Research Bissam Central Asia. Almaty, December-April, 2018

All the above-mentioned leads to a crisis in higher educational development in the country. The reason for decline in the quality of education as noted by a number of analytical companies is: aging of scientific and pedagogical staff, which leads to impossibility of reproducing the main economic resource of qualified specialists. The analytical center Bissam conducted a survey (2012) which fixed an average age of a doctor of sciences at the level of 56 years, a candidate of sciences - 46 years, a scientific worker (teacher without scientific degree) - 39 years. The problems of quality training in higher educational institutions are:

- low payment of university teaching staff;
- lack of timely reaction to forecasts of scientific and technological progress development;
- more than 50% of surveyed university professors participate in scientific work only within the so-called "state budgetary subject" (Bissam 2012);
- that often indicate lack of real research activity or insufficient interaction between university and customers and business.

All of this creates the problem of ensuring continuity in scientific and technical potential. In order to transfer to the industrial-innovative economy based on knowledge, in 2003, there was accepted the Strategy of industrial – innovative development of the Republic of Kazakhstan for 2003-2015. The State program of education and science development for 2016-2019 were adopted one of the main objectives of the state program is to provide sectors of the economy with competitive personnel with higher and postgraduate education and the integration of education, science, business and ensuring the real contribution of science to the sustainable development of the country's economy. To achieve this goal, the state adopted a Program for the development of public-private partnership in the Republic of Kazakhstan for 2011-2015 aimed at creating a legislative and institutional framework for the development of this partnership using the mechanisms of interaction between the state, education, science and business.

Despite adoption of the strategy and a number of other programs aimed at stimulating innovation, the close relationship between producers (higher educational establishments) and consumers (business) of new knowledge and technologies remains a rarity in our country. There is an opinion that the main barrier to cooperation between universities and business is a negative attitude and mistrust of companies to quality of education and research, which has carried out in Kazakhstan higher educational institutions. In this regard, the purpose of this work is to identify companies' interest in relationship with higher educational institutions and identify the main barriers and drivers for cooperation. This article has focused on studying the conditions, opportunities and prospects for integration of higher educational institutions and business in Kazakhstan.

In modern conditions, human capital is the determining factor of economic growth. Abroad, the growth of productivity of human capital provides a steady increase in production and efficiency. Competitive opportunities and advantages of any economy are largely determined by the accumulated human capital. However, in Kazakhstan, as in other and former Soviet republics, the development of human capital, as the main factor of the country's success in the transition to an innovative economy, is given insufficient attention (Omarova and Yemelina 2017).

The research set the following goals:

- Studying the opinions and assessments existing in scientific community concerning the problems and prospects of higher educational institutions and business integration;
- Studying the needs of representatives of higher educational institutions in Almaty in the framework of training specialists for the labor market.

Research objectives:

- to identify the key motivational factors and problems of higher educational institutions to integrate with business.
- to test the attitude of scientific community to business.
- to reveal prerequisites of an opportunity and prospects for integration of higher educational institutions with business in Kazakhstan.
- to reveal and structure requirements of higher educational institutions to integration with business

Besides, there have been studied the aspects connected with expectations of universities and enterprises from business partnership. Samples of companies for interview and further analysis were formed by quota method. The following criteria were used: experience of cooperation with universities: more than half of the selected enterprises; at least 20% of enterprises should have belonged to the IT sector, 40% - to service sector, 40% - to industrial sectors; size of the company: about a third of enterprises - large, the rest - small, medium or micro-enterprises.

During the survey, there was used technique of personal formalized interview in the place of respondents' work and online questioning by means of Googledoc application. The average duration of the interview was 20-25 minutes. Most respondents were interested in the study, which ensured rather high degree of answer sincerity.

There were interviewed Vice-rectors, experts of higher education, heads of departments, and lecturers of educational institutions responsible for production practice of students, employers and graduates of universities.

During the visit, there was conducted a semi-structured interview between several respondents from one higher educational institution and a company with the aim of obtaining detailed information on the research topic. At the first stage, the questionnaires were distributed online, for carrying out in-depth interview. There was used paper version of the questionnaire for some respondents. To receive e-mail addresses of respondents there were chosen university websites and there were made personally phone.

The general totality were higher educational institutions in the Republic of Kazakhstan where 80 IT specialists graduated. The planned sample size was set at 20 universities in Almaty, in fact, 28 respondents were interviewed. Almaty higher educational institutions were selected to cover all sectors of higher education, since Almaty is the largest city and financial center of the country, which is undoubtedly the leading educational center of the Republic of Kazakhstan. Analysis of the educational market in Almaty shows that there is a large number of multidisciplinary and special higher educational institutions providing exhaustive list of educational services. Many higher educational institutions in Almaty are also basic higher educational institutions (according to the list of basic higher educational institutions approved by the Ministry of Education and Science of the Republic of Kazakhstan, where complex testing is organized and conducted). First, it should be noted that in the educational system 9 higher educational institutions have the national status, 7 of them were founded and operate in Almaty. Selection of higher educational institutions presented the whole sector of higher education (state, national universities, private and mixed, multidisciplinary and more specialized).

To obtain the most authoritative and competent assessments of the state, problems and prospects for development of integration processes of the university and business a qualitative research method was used, that is, - in-depth interviews. There were 3 categories of respondents:

- Heads of higher educational institutions and business;
- Leading scientists and experts of higher education, recruiting specialists;
- Organizers of students' work practice (specialists in career department and teachers involved in production practice).

In total, 15 respondents were interviewed in the technique of in-depth interviews, including vice-rectors, company managers, directors of information technology departments, heads of departments and directors of a number of leading scientific institutes.

### 3. Application functionality

According to a common opinion, the business community is not interested in keeping in touch with universities in the framework of training young professionals. But development of skills and knowledge of graduates necessary for successful entry into the labor market is the advantage of university and business cooperation. Internships help employers to find the best and most loyal graduates for possible subsequent hiring.

Practical experience is of great importance for students, as with its help they get full understanding of theoretical knowledge gained at higher educational institution. With the aim of confirming this hypothesis 5 statements were given to representatives of higher educational institutions, business and graduates. Table 2 shows the block of statements reflecting the attitude of employers towards the relationship with higher educational institutions. Respondents rated the statements on a 5 points scale, *where*: 1 - totally disagree, 2 - disagree, 3 - do not know, 4 - agree, 5 - totally agree.

Table 2. The attitude of higher educational institutions, business and higher educational institutions' graduates to interaction and cooperation

Statements	Average value		
	Employers	Universities	Graduates
Your university gets information from a company about what the company expects from graduates of higher educational institutions.	2,01	3,03	-
Having opportunity to pass practical training is useful for our students and university teachers to gain experience in production.	3	4,03	3,06
Closer relations between universities and enterprises make it possible to identify shortcomings in students' knowledge.	2,05	4,04	3,03
Your university regularly holds discussions with companies about students' projects.	2,02	3,05	-
Students' knowledge can be used to improve production processes in company	2,09	3,04	3,03

Source: compiled by authors

The research results confirmed that it is necessary to agree with the opinions of scientists that in today's conditions in Kazakhstan higher educational institutions and business are created and function practically without consideration of mutual needs, and partnership relations do not correspond to the needs of the up-to-date market economy, do not have adequate legal support and state support. One can definitely say that private companies need highly qualified personnel with innovative potential, since to some extent the success of the company and its leadership positions depends on it. However, business does not take part in educational process of training the personnel, among the reasons mentioned are lack of resources, time or need for cooperation, lack of traditions, well-established system of interaction, vision of real benefits. As confirmed by the research of domestic analytical companies "entrepreneurs continue to associate business success mainly with factors of the external environment, namely ties in influential circles. The majority of entrepreneurs underestimate the role of special knowledge and skills for conducting business activity, business education, training and ordering of specialists in higher educational institutions, professional development of personnel".

During the interviews with employers, some respondents expressed such opinion that "business order" for staff and the payment of such order can allow only corporations with sufficient capital. These companies have development goals, ranking the first place in the rating of leading companies. It should be noted that many large companies open their corporate universities and training centers at companies (Corporate Universities "Samruk-Kazyna", Savings bank, business university BI UNIVERSITY, etc.), while investing a decent amount of money for these objectives, thereby mistrusting higher educational institutions in training the personnel and professional development of their employees. Also, employers expressed the opinion that scientists are dominated by paternalistic feelings, that is, they are not looking for additional sources of funding for their research. They mostly rely on budget funding and do not use crowd funding opportunities, company sites that announce competition for fresh innovative ideas to solve certain issues, such as <https://www.kickstarter.com>, Kaggle Competition. Business representatives point out that market mechanisms for increasing the efficiency of research such as formation of competitive environment in scientific sphere, creation of flexible forms of material incentives for research, and so on, remain far in the background in minds and perceptions of university researchers.

As noted above, the next research problem is identification of the "barriers" interfering cooperation between universities and business. The study showed that higher educational institutions and business perceive and assess problems of interaction in different ways. There are some obstacles in interaction of business and education system. They are from the business point of view:

- business needs are not placed in one line with the mission and strategy of a university; there is a time gap in the speed of functioning the universities;
- they do not provide the required competencies or infrastructure for business needs; universities cannot quickly solve problems and respond to market demands, existence of bureaucracy and financial restrictions slow down cooperation as well. Among obstacles to cooperate, there are also different motives and values. Activities of higher educational institutions are far from business needs.

Nowadays there is no focus to the market in the research activity of higher educational institutions. The result of researchers' work is measured by the number of publications, but not by practical use. In order to determine the problems arising at the interaction, it was suggested to estimate channels by means of which the interaction can take place on a 5 points scale: where: 1 - totally disagree, 2 - disagree, 3 - do not know, 4 - agree, 5 - totally agree (Table 3).

Table 3. Estimation rate

Statements	Average value	
	Employers	Universities
The company has an employee engaged in placement of students and lecturers in production practice/ the University has an employee engaged in placement of students and teachers in production practice	2,73	3,91
Interaction of a university with business is always based on personal contacts	2,61	3,36
There are few researchers and scientists in enterprises	2,75	-
Business of Kazakhstan is not interested in cooperation with higher educational institution	-	3,13
University researchers and scientists are not familiar with the real needs of business	3,61	2,72
Researches, conducted in Kazakhstan universities are mostly of poor quality	2,81	2,72

Source: compiled by authors

According to respondents, improving the legislative framework of the country, raising awareness of the possibilities of cooperation would improve interaction. The respondents from the University and business



considered it important to improve and effectively develop cooperation. At the same time, cooperation between Universities and enterprises in Kazakhstan will become not a rarity, but a pattern both sides will be able to benefit from this. There are differences with regard to "drivers" number. 5, 6, 7. So, respondents from universities did not take into account these "drivers", and business considers "more generous tax benefits" are not unimportant motivation for effective cooperation with universities.

The academic and business environment has long come to understand that they should exist together. At the same time, there are still many questions about how to establish a dialogue, how to be useful to each other, how to diversify forms of interaction. Unfortunately, interdepartmental barriers, insufficient funding, lack of economic incentives for the private sector hinder the successful integration of universities and businesses.

Currently, one of the criteria for the quality of services provided by universities in Kazakhstan is the share of employed graduates from their total number. But The Global Employability University Ranking, QS Graduate Employability Rankings take into account not only the number of employed (weighting 10%), but also the reputation of the University among employers, cooperation with business, joint projects of students and production, representation of employers' offices at universities (weight ratio from 15 to 30%). Since these indicators are not available today and information on the interaction and partnership of the University with business is provided by the National chamber of entrepreneurs since 2015, it was not possible to build a model according to the global Employability University Ranking criteria, QS Graduate Employability Rankings.

In order to develop the concept of modeling the activities of higher education institutions under the influence of integration and partnership in innovation activities, we tried to simulate the multi-factor model of the employment of graduates from the partnership of universities and business of the Republic of Kazakhstan in the field of innovation using the tools of econometrics.

Panel data for 10 years (2005 to 2015) were used to model the impact of R & D partnerships between universities and enterprises on youth employment. The panel data set is a spatial sample of features that can be traced over time and represents a set of observations over each individual feature. The use of panel type for research has a number of advantages:

- providing the researcher with a large number of observations, which increases the number of degrees of freedom and reduces the dependence between the explanatory variables, and therefore standard errors;
- the ability to track the individual evolution of the characteristics of all sample objects in time;
- avoid specification errors that occur when main variables are not included in the model.

As a dependent variable was used Y, the indicator "youth labor market/employed population of thousands of people", the following variables were considered as independent indicators: number of organizations (enterprises) that conduct R&D, units, scientific research and development; gross enrolment in higher education.

Table 4. Variables used

Years	Number of organizations (enterprises) that conduct R & d, units (V1)	Scientific research and development (V2)	Youth labor market/employed population thousand people (V3)	Gross enrolment in higher education % (V4)
2008	390	41512	1995,2	57,16
2009	437	51400	2038,4	55,75
2010	438	64108	2082	52,5
2011	421	81810	2127	49,33
2012	414	90925	2107	49,6
2013	424	103571	2180,4	49,5
2014	412	121395	2222,1	53,14
2015	345	148530	2298,9	53,39
2016	341	153567	2259,6	50,9
2017	392	171626	2341,1	48,37
2018	390	184940	2316,4	48,44

Source: compiled by authors



Table 5. Model: Least Square Method (LSM), observations 1 - 4 were used Dependent variable: v3

	<i>Coefficient</i>	<i>statistical error</i>	<i>t-statistics</i>	<i>P-meaning</i>	
V1	1,74117	0,39024	4,4618	0,0021	***
V2	0,00387447	0,000290403	13,3417	<0,0001	***
V4	20,403	3,13037	6,5178	0,0002	***
Average of dependent changes		2.178,918	Statistical deviations. dependent changes	117,78580	
Sum of quadratic remainder		19.269,10	Statistical error of the model	49,07787	
R- square		0,999632	R-square correction	0,999540	
F(3, 8)		7.243,93000	P-meaning (F)	4,51e-14	
logarithm verisimilitude		-56,68432	Akaike Criterion	119,3686	
Schwartz Criterion		120,56230	Hannan-Quinn Criterion	118,6162	

Source: compiled by authors

The analysis of the correlation coefficient matrix did not show multicollinearity, this suggests that the obtained estimates of the regression model parameters are reliable. In the first stage, there was constructed and investigated a cross-cutting regression estimated by the ordinary least squares method. Total evaluation of the model equation ignoring the panel nature of the data allowed us to obtain the following result:

$$\hat{Y} = (V_1)1.74117 + (V_2)0.00387 + (V_4)20.403$$

$$T\text{-stud} (4,4618) \quad (13,3417) \quad (6,5178)$$

Analysis of the results shows that the regression equation is adequate, since the calculated value of the Fisher criterion is 7243,930, while the critical value is 3.8, which is significantly less. The coefficient of determination  $R^2 = 0.999540$  is quite large. It is also possible to notice that all coefficients of the regression equation ( $V_1$ ,  $V_2$ ,  $V_4$ ) are significant according to Student's criterion. The analysis of the time series suggests that the pattern of development in the past will continue in the projected future, and therefore the forecast is based on extrapolation. This indicator can be calculated for the next three years using correlation and regression analysis. When predicting the same indicators for the next three years (2018, 2019, 2020), the correlation and regression analysis shows a positive growth.

From the given model it follows that three integral indicators have a significant positive impact on the employment of University graduates. Thus, the study revealed an increase in the number of enterprises engaged in R&D by 1 unit leads to employment of 1.74 graduates. The increase in the share of R &D spending also reduces the number of unemployed by 0.003 and the high educational level of young people leads to decrease the unemployment by 20.40 people.

Today, the monitoring of employment of graduates of universities of Kazakhstan are carried out through the integration of IC "Unified system of higher education management" Ministry of Education and Sciences of the RK and "State center for pension payment (SCPP) system. The employment rate of University graduates in 2015, confirmed by the data of the SCPP, was 71.4% (2014 - 69.8%). The share of employed among the holders of educational grants was 82.2% (2014 - 84%).

In 2015, KBTU became the leader in employment of graduates in the first year after graduation (98.7%). Also in demand are graduates of KAZGUU University (88%), KNMU named after S. D. Asfendiyarov (88%), WKSU. Named after M. Utemisova (87%) and KRMU (87%) [33]. The lowest percentage of employed University graduates in the first year after graduation showed MSTU (44.5%), University of foreign languages and business career (43%), University "Astana" (42%), Egyptian University of Islamic culture "Nur-Mubarak" (41%) and PSU. Named after S. Toraihyrov (31%).

## Conclusion

The main purpose of the research was to study opinions and assessments existing in scientific community on the problems and prospects of higher educational institution and business integration and study the needs of representatives of higher educational institutions of Almaty in training specialists for the labor market.

The research showed that business is mainly interested in highly qualified personnel, but there is passive participation in internal educational processes of higher educational institutions, such as assistance in the development of educational programs, organization of production practice and training of faculty and university students for obtaining their professional competence. Also business representatives consider that lecturers of higher educational institutions are not familiar with the real needs of the real sector of economy. It generates the

contradiction when lecturers of higher educational institutions could not independently provide competitive quality of educational services demanded by modern society without employer's assistance. Employers do not understand possible consequences of the situation and do not use the potential of higher educational institutions effectively as a form of training human resources for reproduction of their business. Thus, the problem of improving interaction between higher educational institutions and business community is caused both by underestimation of its importance by business, and economic instability of many companies. Therefore, our conducted research helps to pay attention to the existing barriers and opportunities for development towards the integration of higher educational institutions and business, which is necessary for solution of personnel issues in the context of transferring the country's economy to innovative way of development.

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## Inequalities and Pro-Poor Growth: The Effectiveness of the Redistributive System

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### Abstract:

The aim of this paper is twofold. First, analyze the relationship between inequality, growth and poverty. Second, study the effectiveness of the redistributive system in Morocco through a comparison between primary distribution of income by wages and secondary distribution by transfers. Our results show that growth is not pro-poor and can only reduce poverty if inequality does not increase. This situation is aggravated by non-progressive state transfers, which increase the inequalities in the majority of Moroccan regions. On the other hand, the increase in wages seems to have the opposite effect on inequality.

**Keywords:** Inequality; wellbeing; pro-poor growth; redistributive system; poverty; local government transfers

**JEL Classification:** H11; H30; H60; D63; H70; C54

### Introduction

Today, the observation of spatial disparities in the world reveals a rise in the level of inequalities. According to Alvaredo *et al.* (2018), economic inequality is widespread and, in some cases, inevitable. This inequality does not only exist between countries but also between individuals in the same country depending on their level of development.

The purpose of this work is twofold. First, analyze the relationship between inequality, growth and poverty. Second, study the effectiveness of the redistributive system. To reach these objectives, this paper examines, in addition to the relationship between inequality and growth, the role of the redistributive system in Morocco through a comparison between primary distribution of income by wages and secondary distribution by transfers.

This article is structured as follows: first we analyse theoretical contributions dealing with the triangular relationship between growth, inequality and poverty. Then, we study the effect of growth and inequality on poverty, using the decomposition of poverty according to the approaches of Datt and Ravallion (1992). Finally, we analyze the effect of the distributive system on the aggravation of inequalities, using the decomposition of Lerman and Yitzhaki (1985) at the regional level.

### 1. Literature review

#### 1.1. Inequality growth relationship. The Kuznets model

The inequality vs. growth debate has led to several studies in both developed and developing countries. Thus, several explanations were provided and several effects were highlighted. The results of research on the relationship between inequality and growth, however, are not consensual. For some, inequality acts positively on growth. Indeed, it encourages innovation (Lazear and Rosen 1981), and it stimulates the savings and investment of the rich class (Kaldor 1957). For others, inequality has a negative effect on growth (Alesina and Perotti 1996, Galor and Moav 2004, Garcia-Penalosa *et al.* 1999) and generates political instability (Alesina and Perotti 1996).

However, few studies report a negative relationship between inequality and growth. Indeed, for several years the debate has focused on inequality but recently more and more research is beginning to highlight the negative role of it.

Thus, Berg and Ostry (2011) provide evidence that income inequality plays a major role in economic growth. In particular, they determine how long a period of strong economic growth can last. Their main conclusion is that

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<sup>29</sup> BP. 1373 - Poste principale - Tangier/Morocco.

these periods of growth are more likely to end quickly in countries with larger income disparities. For example, according to Berg, and Ostry (2011), closing the income gap by half in Latin America or Asia could double the expected duration of the period of strong economic growth.

Stiglitz (2012) supports these claims by showing that income inequality is associated with unstable economies and unsustainable economic growth. As a result, these findings cast doubt on the long-term benefits of moderate income inequality.

The prevalence of crime is another way in which income inequality can affect the growth rates of an economy. For developing countries, this is probably an even bigger issue. Lowrey and Erzikova (2012) argues that large income differences in these countries lead to political instability which, in turn, leads to violence. The recent series of revolutions in the Arab world seems to support his analyzes. Moreover, Wilkinson and Pickett (2009), show that inequality is directly correlated with crime rates that hinder economic growth by discouraging investment and capital accumulation (see Josten *et al.* 2003).

Empirical studies have not only focused on the macroeconomic effects of inequality on growth, they have also highlighted the microeconomic aspects of this relationship. Among these aspects there is the issue of competition between companies for the most skilled workers which can affect the overall economy. The importance of some jobs may be underestimated in terms of salary, and the best talent could be diverted to higher paying jobs.

Bénabou and Tirole (2013) show that highly competitive labor markets mean that firms offer less to low-skilled workers in order to offer more to those with high skills in the form of high performance bonuses. These bonuses can greatly contribute to an accumulation of assets which leads to greater inequality.

However, all the empirical evidence cited considers the relationship between inequality and growth as linear. However, this is not always the case. According to Kuznets (1955), this relation takes the form of an inverted U. In other words, at first, per capita income increases with increasing inequalities. When these inequalities reach their maximums, they begin to decrease with the increase of income. This high level of income is a sign of the emergence of high added value activities and intensive use of scientific research, which is leading economies to focus more on human capital investment.

However, lot of empirical work (Anand and Kanbur 1993, Deininger and Squire 1996) has strongly criticized this view of inequality. From an ideological point of view, this theory raises the question of accepting the idea that a certain level of inequality and by the way, neglects the political and social imbalances that may result from this inequality (Alesina and Perotti, 1993, Bruno *et al.* 1996).

Similarly, Piketty (2015) brings into question the contributions of Kuznets because according to his theory, one could believe that the increase over time of the inequalities of a country is a "natural" phenomenon that resolves with the time, endogenously. It also shows, on French and American data, that the reduction of inequalities is not always associated with GDP per capita growth. It was mainly related to unexpected events affecting the capital (war, inflation, disasters), the tax and the transfer system.

### 1.2. The relationship between inequality and growth: The effect of redistribution

According to Piketty (2013), in order to analyze the distributive income system, it's necessary to analyze the interactions between its different components. Indeed, there is a very strong relationship between the two components of this system namely employment, taxes and transfer. Thus, tax policies can encourage companies to increase or decrease their wages and significantly slow down growth. In this case, the effect of the tax system and transfers is negative.

The work of Persson and Tabellini (1994), Perotti (1993) and Alesina and Rodrik (1991) clearly demonstrates the negative aspect of inequality on growth. They show that, even if economic growth is largely determined by the accumulation of physical and human capital and technological knowledge, however, excessive taxes and regulatory policy can reduce this accumulation. Thus, high inequality can lead to a high demand for redistribution, which implies high taxes that reduce accumulation and therefore reduce growth.

Arthur Okun (1975) was among the first to analyze the negative effect of redistributive policies. In his book Okun argues that equality can reduce efficiency (total output with a given level of resources). According to him, not only does greater income equality reduce the incentive to work and to invest, but redistributive efforts, through means such as taxation and the minimum wage, can themselves be costly. Thus, some of the transfers from the rich to the poor will never reach the poor. He considers the redistributive policies of the state as ineffective and compares it to a leaky bucket because of his administrative costs.

According to Sandmo (1993) efficiency means to finding an optimal redistribution which makes possible to obtain a Pareto optimum. However, because of the fiscal distortions, this optimum cannot be obtained in reality (Organization for Economic Co-operation and Development, 2012). Indeed, empirical studies show that the

elements of fiscal policy create distortions because it leads to a modification of the relative (and absolute) price system. This is because fiscal policies are sometimes sources of inequality. Indeed, it can lead to forms of activities, certain economic functions or even certain social classes. As a result, several approaches to measure these inequalities have emerged. According to Bobe (1975), there are two main approaches to measuring this phenomenon.

The first is, from the perspective of Keynesian theory, to assess the inequalities resulting from redistribution by worrying about the disposable income of households (Vijverberg 2003, Bibbee 2008). This type of approach usually involves two types of redistribution: vertical and horizontal.

The vertical redistribution of income is about transfers from households or individuals with different incomes. In other words, it is a redistribution that seeks to reduce income inequality. Thus, one of the privileged instruments for this type of redistribution is the progressive tax.

Horizontal redistribution is related to the transfers based on criteria other than income (Lambert and Ramos 1997, Berliant and Strauss 1985, Atkinson 1979). These criteria relate to people at different social risk: sickness, maternity, *etc.*

On the other hand, we can distinguish two conflicting theories on which these concepts of vertical and horizontal redistribution are based. The first theory formulated by Atkinson and Stiglitz (1976) argues that it should not be a difference in taxation between two goods. This theory seems to be verified empirically in the case of developed countries. The report of Bourguignon and Bureau (1999) for the "Conseil d'Analyse Economique et Sociale" shows that the redistributive power of VAT in France is low because the structure of household consumption is not sufficiently differentiated. Thus, a simplified VAT rate would have a greater redistributive effect because it would make it possible to limit horizontal inequalities. In this case, two people with the same income will bear different tax burdens if their social situation differs.

The second theory shows that for developing countries, indirect taxation seems to be a preferred fiscal instrument. Tax evasion justifies the use of indirect taxes.

However, according to Mahon and College (2009) who worked on Latin American data, tax reforms focus more on horizontal rather than vertical equity. According to them, this fact does not put into question the ability of fiscal policies to reallocate income. However, fiscal policies should be able to generate more income and use them smartly to reduce poverty and inequality.

## 2. Methodology

The 80s and 90s were marked by an abundance of literature on the phenomenon of poverty and its links to growth and inequality (Bigsten and Levin 2001). The majority of work on this issue indicates that growth is often accompanied by poverty reduction.

However, the link between economic growth and the inequality is not systematic. Indeed, it is dependent on many factors including the efficiency of the redistributive system.

This aspect is poorly studied especially in developing countries where the lack of data restricts the empirical analysis. However, there are some alternatives to this lack, including the use of decomposition techniques. Thus, there are three main approaches used in these techniques.

The first is the static approach of Kakwani (1993). This method consists of measuring the elasticity of poverty in relation to average income or to expenditure and inequality. These elasticities are measured using Lorenz curve and are used to estimate changes in poverty due to both the variation of the expenditure and inequality. Thus, Kakwani (1993) shows that for a given poverty line, the variation of poverty is the result of two reverse effects: A pure growth effect (change in income or expenses) and an inequality effect.

The second is the dynamic approach of Datt and Ravallion (1992). This approach is used to assess the contribution of growth and redistribution to poverty. It implies the existence of a residual. Thus, three components are generated by this approach:

- A growth component that estimates the change in poverty following a change in the Lorenz curve.
- A redistribution component that assesses the change in poverty due to a change in the Lorenz curve when the average income is constant.
- A residual component which measures interactions between growth effects and redistribution effects.

Even if it makes possible to evaluate more precisely the components of growth and redistribution whatever the reference date, this error term magnitude may however be greater than the other two components.

The third is Kakwani 's (2000) dynamic approach, which integrated the advantages and avoid limitations of the last two approaches, to develop a new decomposition method that breaks down the FTG poverty indices. This approach allows us to take into account the dynamics of poverty between several periods and to eliminate the



residual term resulting from the decomposition of Datt and Ravallion (1992). Thus, the variation of poverty is a function of the variation of growth and the variation of inequality. This approach is considered axiomatic because it admits three axioms that determine the form that this function must take.

In this paper, the approach used is that of Araar (2012) based on the Kakwani (2000) decomposition. This method has the advantage of being prospective and allows the projection of poverty using the most updated distribution and simulating a predefined pattern of change in distribution. It is based on the estimation of the change in poverty implied by the change in income distribution. This effect is called semi-elasticity of poverty in relation to a given component of distributive change. In this approach, the overall elasticity of poverty is measured with respect to change in the growth of average spending or relative to the change in inequality.

Formally, for the class of additive poverty indices, if we denote the poverty index by  $P(z)$ , the poverty change is defined as follows:

$$\Delta P(z) = \int_0^z \pi(z, y) \Delta f(y) dy \tag{1}$$

where:  $\pi(z, y)$  denotes the contribution to total poverty of individuals whose income is equal to  $y$ ; Let  $M(y_s)$  be the map of income change with the scheme  $s$  (growth or redistribution). We assume that the parameter  $y_s$  expresses the intensity of the change. The semi-elasticity of poverty with respect to  $s$  will be defined as follows:

$$k_s = \frac{\partial P}{\partial y_s} \tag{2}$$

Considering that the elasticity of poverty in relation to  $s$  is given by:

$$E_s = \frac{k y_s}{P} \tag{3}$$

The total impact on implicit poverty through distributive change with the  $M(y_s)$  map is:

$$\Delta P(z) = k y_s dy_s \tag{4}$$

At this point, we present estimation methods starting with the counterfactual approach (in the absence of intervention).

This approach is based on the estimation of the difference between the poverty under the counterfactual distribution and that of the initial distribution. Formally, if we make  $g$  the level of economic growth, the counterfactual income  $y_g^c$  can be defined as follows:

$$y_g^c = (1 + g)y \tag{5}$$

Inequality is managed in this equation by adding a bi-polarization factor  $(\lambda - 1)(y - \mu)$  to each income:

$$y_g^c = y + (\lambda - 1)(y - \mu) \tag{6}$$

The integrating factor  $(\lambda - 1)$  in the equation is equivalent, according to Araar (2012), to the proportional increase in the Gini index.

This counterfactual approach, however, has a limit. In fact, when the change is marginal, the individuals who can escape poverty are those whose income is closest to the poverty line. Thus, when we use household surveys, we cannot directly observe this group of population because the sample may not contain observations with incomes exactly equal to the poverty line. In this case, and assuming continuity in the distribution of income we can estimate the density function, by using the kernel estimator, and then estimate the impact on poverty.

According to Araar (2012), this method will yield more accurate results to deduce for the entire population. This method is used in what Araar (2012) calls the analytic approach. It is used when the FGT poverty index is used to assess poverty and when growth refers to the marginal change in average income. In this logic, the semi-elasticity of global growth ( $k_g$ ) of poverty is given by:

$$k_g = \begin{cases} -zf(z) & \text{si } \alpha = 0 \\ \alpha[P(z; \alpha) - P(z; \alpha - 1)] & \text{si } \alpha \geq 1 \end{cases} \tag{7}$$

where:  $z$  is the poverty line,  $f(z)$  is the density function at the income level equal to  $z$ . Global inequality of semi-elasticity ( $k_r$ ) of poverty when growth is zero is given by:

$$k_r = \begin{cases} (\mu - z)f(z) & \text{si } \alpha = 0 \\ \alpha[P(z; \alpha) + (\mu/z - 1)P(z; \alpha - 1)] & \text{si } \alpha \geq 1 \end{cases} \tag{8}$$



Another way to estimate expected changes in poverty is to model the distribution of income. Subsequently, one can derive the intrinsic formulas to define the expected change in poverty resulting from growth or redistribution. The literature proposes different functional forms to model the distribution of income. Among them, the Log-Normal distribution functions. Bourguignon (2002) shows that when the income distribution follows a lognormal distribution with a mean  $\mu$  and a standard deviation  $\sigma$ , the size can be defined as follows:

$$P(z; \alpha = 0) = \Phi \left[ \left( \frac{\log(z/\mu)}{\sigma} \right) + \frac{\sigma}{2} \right] \quad (9)$$

where: refers to the cumulative normal distribution function. For the poverty rate, the half-elasticity of growth is defined as follows:

$$\mathbf{k}_g = \frac{1}{\sigma} \boldsymbol{\varphi} \left[ \left( \frac{\log(z/\mu)}{\sigma} \right) + \frac{\sigma}{2} \right] \quad (10)$$

where  $\varphi(\cdot)$  is the normal density function.

As Aitchison and Brown (1957) have shown, for the Log-Normal distribution, the Gini index is defined as follows:

$$G = 2\Phi(\sqrt{\sigma/2}) - 1 \quad (11)$$

The semi-elasticity due to the changes of inequality is when it defined as follows:

$$\mathbf{k}_g = \boldsymbol{\varphi} \left[ \left( \frac{\log(z/\mu)}{\sigma} \right) + \frac{\sigma}{2} \right] \left[ \frac{1}{2} - \left( \frac{\log(z/\mu)}{\sigma^2} \right) \right] \quad (12)$$

The last approach proposed by Araar (2012), is the numerical approach, which relies mainly on estimating the approximation of the real density function of the income distribution, see Araar (2012) for more details on the methodology. Figure 3 shows the relative change in the poverty rate when average income changes by keeping the income distribution constant.

### 3. Empirical analysis of the relationship growth, inequality and redistribution: Evidence from Morocco

#### 3.1. Context of growth and inequality in Morocco

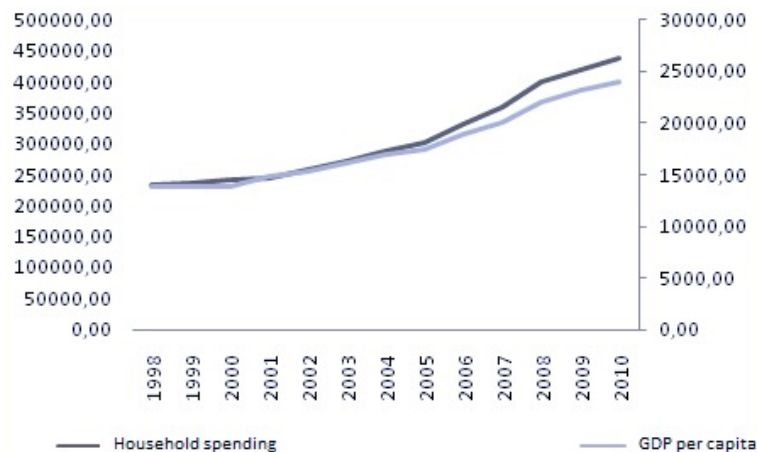
From the first years of Morocco's independence, national programs were implemented to strengthen the economic fabric and support the country's social changes. However, the instability of economic growth due to several circumstances including climatic hazards, delayed the process of accumulation of wealth. Thus, the results of the development plans have been below the aspirations of the country.

However, accumulation cannot lead to development without a good redistribution of income created by economic activity. Indeed, income distribution is an important dimension of human development in a country. In Morocco this redistribution is still strongly marked by inequalities and the persistence of poverty. Thus, despite the growth experienced by Morocco between 2001 and 2007, the inequalities, measured by the Gini index, practically increased between 2001 and 2007.

Thus, according to the data of the HCP, the GDP per capita has passed between 2001 and 2007 from 14789 Dhs to 19982 Dhs is an increase of 35% (Figure 1). In the same way, household final consumption expenditure has changed by 46.17%.

This rise in incomes and standard of living has been accompanied by an increase in inequality. In fact, the concentration of consumer spending, as measured by the Gini index, increased during the same period from 0.4063 to 0.4072. It should be noted, however, that the richest 10% of the population accounted for nearly 33% of total household consumption and recorded a per capita expenditure of almost 12 times that of the poorest 10%.

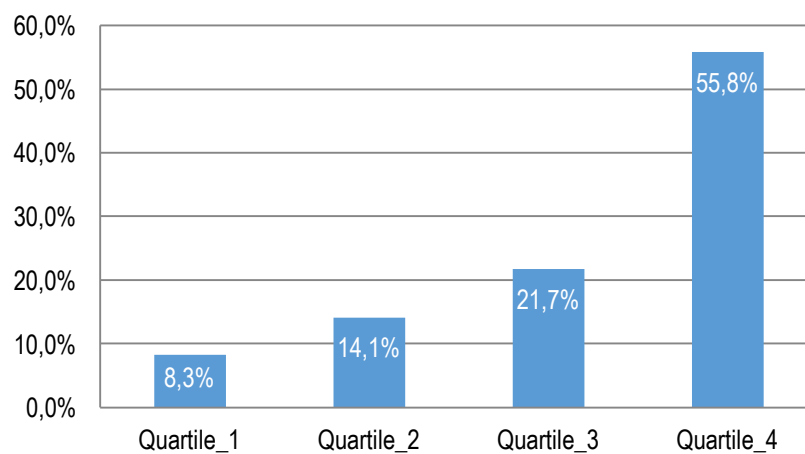
Figure 1. Evolution of final consumption expenditure of households and GDP/head



Source: Authors computation.

The distribution of expenditures by quintile (Figure 2) shows that the highest expenditure quintiles account for the majority of the population's overall expenditures.

Figure 2. Spending quintiles concentration



Source: Authors computation.

Thus, more than half of the expenditures (55.8%) are generated by a quarter of the population. The last quarter of the population generates only 8.3% of consumption against 14% for the second quartile and 21% for the third. As a result, the last quartile generates more than 47% more than the first quartile. This difference in the concentration of consumption between the richest populations shows the extent of the inequalities of well-being which are all the more glaring in the analysis of density. Indeed, the distribution of expenditures shows a high density in the low expenditure classes and much less in low income classes.

However, inequality is more pronounced between 2001 and 2007 than in the 1960s. In fact, the share in total expenditure, of the 50% of the poorest households, went from 30% in 1960 to 23.7% in 2007, while that of the 25 % having the richest went from 46.0% to 48.0%.

It is important to note that inequalities are even more visible at the spatial levels between urban and rural areas. The ratio between the urban average of per capita consumption and rural consumption has been reduced from 2 in 2001 to 1.8 times in 2007.

### 3.2. Database

This paper uses databases from national household living standards surveys conducted in 2001 and 2007 by the Office of the High Commissioner for Planning.

These surveys are the main source of existing social, demographic and economic data and serve as a statistical basis for defining the main lines of social strategies in Morocco and evaluating policies aimed at improving living conditions.

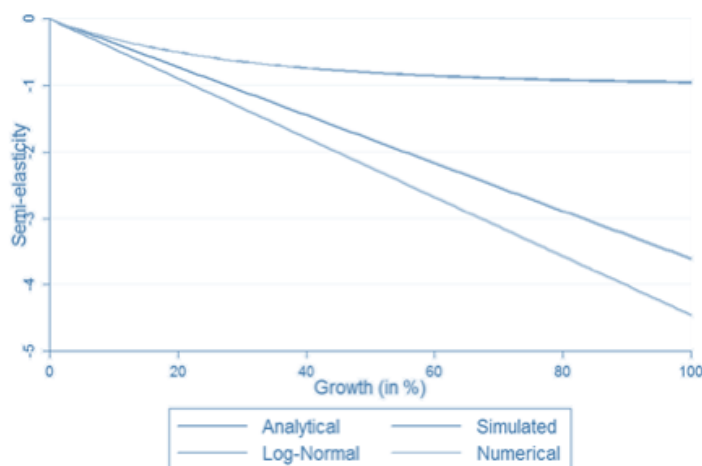
In addition, these surveys are the only sources of data on household consumption in Morocco. As such, they are the only bases for studies and analyzes of poverty, inequality and standard of living. The objective of these surveys was to collect data of individuals and households' characteristics (demographic characteristics, schooling, health, employment, etc.).

They cover the entire Moroccan territory and include different sizes of households and different socio-economic groups, except collective households.

### 3.3. Results

Figure 3 shows the relative change in the poverty rate when average income changes by keeping the income distribution constant.

Figure 3. Elasticity of poverty on growth



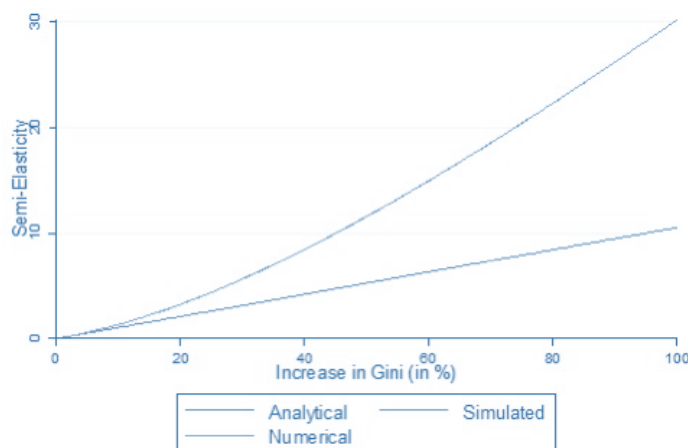
Source: Authors computation.

According to this figure, the elasticity of growth with respect to poverty is less than 0. In other words, any increase in economic growth would lead to a fall in the various poverty indices in a more than proportional way, provided that this growth does not generate an increase in inequality. However, if growth is negative, poverty in all its forms may increase further, especially if this level of growth is not accompanied by a reduction in inequalities.

However, to better study redistributive policies, it is necessary to analyze the effect of an increase in inequality on poverty. Thus, using the same previous method, we estimate this effect.

Figure 4 shows the relative change in the poverty rate, when the Gini index changes while maintaining the same level of incomes.

Figure 4. Elasticity of poverty to inequality



Source: Authors computation.

We find that the elasticity of inequality to poverty is greater than 0, *i.e.* each increase in inequality results in a proportional increase in poverty if income remains constant. These two figures allow us to say that the reduction of poverty in recent years is mainly related to the effect of growth. To compare these two effects, we used the marginal rate of substitution to see which effect surpasses the other. Also, we have decomposed the growth of poverty for each region in Morocco.

Table 1. Elasticity of inequality and growth on poverty by region

Région	Growth	Inequality	TMS
Oued-Ed-Dahab-Lagouira	-2.339	2.800	1.197
Laâyoune-Boujdour-Sakia el Hamra	-1.320	4.370	3.312
Guelmim-EsSmara	-3.243	8.170	2.519
Souss-Massa-Drâa	-4.172	9.750	2.337
Gharb-Chrada-BeniHssen	-5.847	9.470	1.620
Chaouia-Ouardigha	-2.042	4.270	2.091
Marrakech-Tensift-Al-Haouz	-3.842	9.520	2.478
L'Oriental	-2.298	6.200	2.698
Grand Casablanca	-1.108	3.840	3.465
Rabat-Salé-Zemmour-Zaer	-2.014	7.880	3.913
Doukhala-Abda	-5.908	10.320	1.747
Tadla-Azilal	-3.939	7.020	1.782
Meknes-Tafilalet	-4.471	9.550	2.136
Fès-Boulemane	-2.342	6.780	2.895
Taza-Al Houceima-Taounate	-4.091	7.270	1.777
Tanger-Tétouan	-2.268	8.130	3.584

Source: Authors computation.

The results in the table above show that the absolute value of the elasticities of poverty in relation to growth (expenditure per capita) is greater than 1, whatever the place of residence. In other words, any increase in economic growth would lead to a more than proportional decline in poverty, provided that this growth does not generate an increase in inequality. However, if growth is negative, poverty may increase further, especially if this level of growth is not accompanied by a reduction in inequality.

By focusing on the poorest, the elasticities of poverty relative to inequality tend to move away from spending elasticities. This shows that poverty indices are more sensitive to changes in inequality than to changes in the level of spending, especially for the poorest.

The TMS calculates the percentages with which the effect of growth is offset against the effect of inequality so that poverty does not increase. A 1% increase in inequality at the national level should be accompanied by economic growth of 1% to keep the incidence of poverty at its initial level.

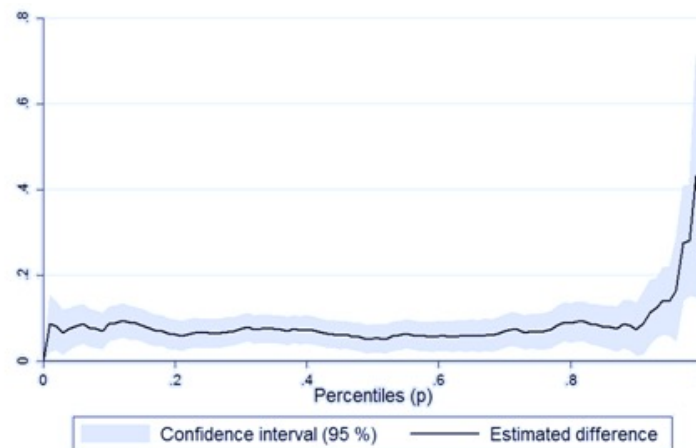
All these results show us that even if in theory inequality allows the accumulation of human capital and by extension the increase of growth. This growth is not in favor of the poorest, since the resulting inequality appears to have a greater negative effect on poverty than the positive effect of growth. Hence the interest of studying pro-poor growth.

This concept implies that economic growth must allow an increase in the income of the poorer classes in a larger way than that of the rich classes. In other words, growth must involve a reduction of inequalities. As a result, economic policies are said to be pro-poor, if they lead to a better redistribution of growth benefits.

As in most theoretical and empirical work, pro-poor growth is highlighted, on the one hand, by the construction of the pro-poor growth index by applying the decomposition of Datt and Ravallion (1992), and on the other hand, by using the incidence curve of Growth.

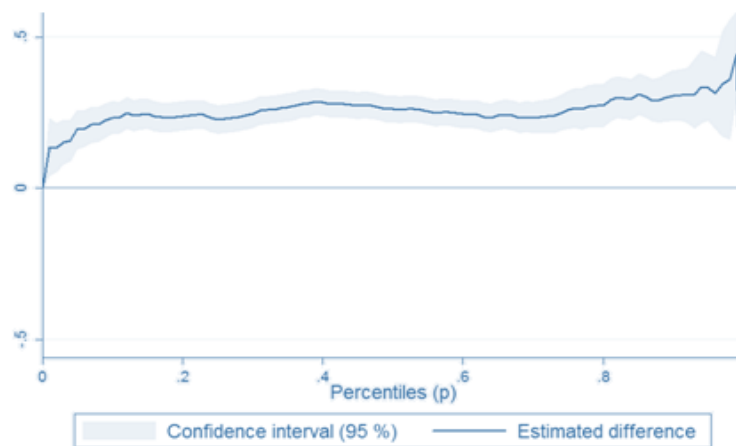
In this article, we use the incidence curve. Also, to better appreciate the inequality, we calculated the incidence curve in urban and rural areas.

Figure 5. Pro-poor growth curve in the middle urban



Source: Authors computation.

Figure 6. Pro-poor growth curve in rural areas



Source: Authors computation.

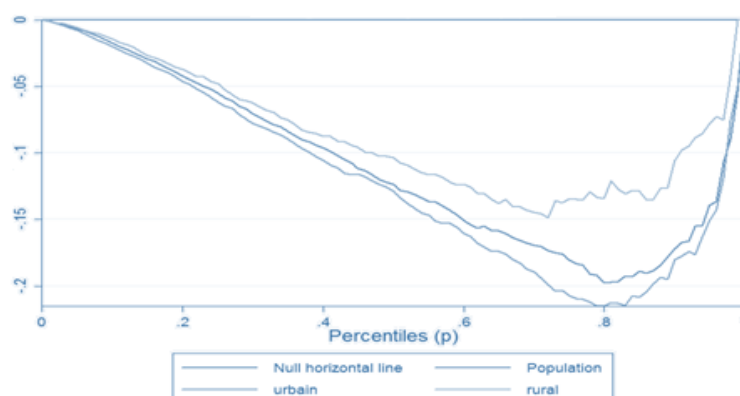
The two incidence curves (Figure 5 and 6) show that the last percentiles of the population benefited more from growth than the other percentiles and those in urban and rural areas. However, it seems clear that there are differences between rural and urban areas. In rural areas, while the lower income classes' benefit least from growth, the middle class benefits from it.

However, in urban areas the inequalities seem more obvious. The rich benefit much more from growth and the middle class, meanwhile, does not benefit from this wealth. This result shows once again the failure of the redistributive system, because even if the rural creates more wealth. This richness is of little benefit to the middle class.

Now the question that arises: Can redistributive policies based on transfers, for example, improve the situation or, on the contrary, make it more critical? To answer this question, we used the approach based on the comparison between the effects of primary and secondary distribution of income on inequality, in order to test the effect of redistributive policy (secondary distribution) and the effects capital accumulation (primary distribution). Before making this comparison, we first present the effect of transfers granted by the state to households.

Most talk about progressivity when there is a tax or subsidy scale that increases when you move from a low income class to high one. However, this definition remains very limited. According to Norregaard (1990), progressivity is when the income elasticity of the tax is greater than 1. It is also the case when the transfer depends on income. Formally, the marginal income associated with a transfer must be greater than or equal to the average transfer amount.

Figure 7. Progressivity curve of transfers



Source: Authors computation.

Figure 7 shows that the difference between marginal income and average transfer decreases with increasing income, until reaching the last income quintile (*i.e.* the richest 20%), in which this difference increases very quickly before reaching the maximum threshold.

Thus, we conclude that a non-progressive transfer seems to benefit the rich more than the poor. If even the secondary distribution seems to have many limits, it is necessary to know if his effects are greater or smaller than that of the distribution of wages. Thus, to analyze this question we used the decomposition of the Gini index by source of income using the approach described by Lerman and Yitzhaki (1985). This approach allows the calculation of the impact of a marginal change in a particular source of income on inequality.

Table 2. Elasticity of transfers and wage on inequality

Tranche	TRANSFERS	WAGE
Oued Ed-Dahab	-0.0004	-0.307
Laayoune - Boujdour - Sakia el Hamra	0.074	-0.026
Guelmim - EsSmara	0.010	-0.060
Souss – Massa - Draa	0.016	-0.040
Gharb – Chrada - BeniHssen	0.015	-0.045
Chaouia - ouardigha	0.015	-0.032
Marrakech Tensift Al Haouz	0.011	-0.030
The Oriental	0.019	-0.159
Greater Casablanca	0.017	-0.141
Rabat – Salé – Zemmour - Zaer	0.011	-0.018
Doukhala - Abda	0.018	-0.066
Tadla - Azilal	0.010	-0.142
Meknes -Tafilalet	0.031	-0.036
Fès - Boulemane	0.022	-0.163
Taza - Al Houceima - Taounate	0.010	-0.051
Tanger - Tetouan	0.025	-0.077

Source: Authors computation.

Table 2 clearly shows that transfers in all regions, except Oued Ed-Dahab-Lagouira, increase inequalities in household spending, while wage negatively affect inequality.

Thus, the region where transfers have greatest effect on inequality is Laayoune-Boujdour-Sakia el Hamra (0.074), this region is also where the effect of wages on inequality is the lowest (- 0.026). Similarly, the regions where the effect of wages is higher (-0.307) is where the effect of transfers is positive. This may suggest that an increase in wages could not only reduce inequality but also help to improve the effect of transfers.

Also, the marginal positive effects of wages tend to be greater than the negative marginal effects of transfers in most regions, except for the Eastern region, Gharb-Chrada-BeniHssen, Laayoune-Boujdour-Sakia el Hamra and Grand Casablanca.



## Conclusion

This paper to show that growth in Morocco is generating inequalities. Indeed, the elasticity of inequality to growth is high. Also, the growth does not appear to be pro-poor. In addition, these inequalities appear to be aggravated by the transfers made by the state in the context of redistributive policies. This effect seems to contradict the theoretical arguments which suggest that income redistribution reduces inequality. In the other side, the increase in wages reduces inequality.

From these results, we can say that public policies must attempt to redistribute income to work, by increasing the wages that companies pay for each worker. For example, by increasing the legal minimum wage or supporting the unions in their demands for higher wages.

In addition, the reduction in income tax, even if it results in a reduction in transfers, will be more effective in reducing inequalities. On the other hand, it will be necessary to think about the restructuring of the redistributive system by adopting new systems of transfers known as smart as the PROGRE-SA/Oportunidades programs in Mexico and Bolsa Escola/Bolsa Familia in Brazil. These transfers are based on the decentralization to municipalities of social sector financing such as education and health. These municipalities grant transfers in a conditional manner and are linked to the frequency of use of social services.

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## Is it Worth Paying High Fee? The Evidence from Bank Affiliated Mutual Fund

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### Abstract:

This study aims to answer to a straightforward question “Is it worth paying high fee?” Based on the mutual fund industry in Thailand between 2008 and 2018, our results show that although mutual fund charges fees differ by its investment objective, we fail to find a difference in return. Further, the results show that the relationship between bank-mutual funds affect both fees and performance of funds. Our findings demonstrate that although non-bank-related funds charge significantly higher fees than bank-related funds, they generate lower return to their investors than bank-related funds.

**Keywords** mutual fund; performance; bank-related; affiliated fund; expense ratio

**JEL Classification:** G11; G12; G21; G23

### Introduction

Mutual fund is a popular choice for an individual investor and a good choice for novice investor. Prior literature suggest that this popularity grows overtime. Over the last decades, Wu (2011) demonstrate the individual prefers mutual fund investment than investment directly in stock. This is because, mutual fund investment offers numbers of benefit. First, mutual fund is managed by professional fund manager or a group of professional fund managers called team management. The fund managers are high investment experience, and skillful trader. In return, fund managers charge number of fees (*e.g.* management fee, administration fee, *etc.*) in lieu of producing worthy fund performance. Hence, investors invested in mutual fund expect to earn superior return compared with portfolios managed by an individual. Thus, funds charge high fees should outperform lower fees charged funds. Many studies question whether is it worth paying high fee.

Prior studies mostly focus on the relationship between mutual fund performance and mutual fund expense for specific fund objective. However, one important characteristic of mutual fund in mutual fund literature is the relationship between bank and mutual fund, which is ignored by the prior studied, plays an important role in evaluating fund performances. Based on bank and mutual fund relationship, mutual funds can be classified into two types. The first type is bank-related funds hereafter BR-funds. Another type is non-bank-related funds hereafter NBR-funds. The BR-funds are the mutual funds managed by an Asset Management Company (AMC) held by a commercial bank, *vis-à-vis* for NBR-funds. These two types of funds have different information and investment constraints to manage their asset.

Bank-related funds managers and nonbank-related fund managers have different investment information and investment constraints to manage their portfolios (Mehran and Rehman 2008, 1712). The prior studies ascertain that BR-funds have a lower information searching cost than NBR-funds (Sirri and Tufano 1998). Hence, BR-funds induce more new investment flow than NBR-funds (Nathaphan *et al.* 2014). As the consequence, BR-funds have less of liquidity constraint.

Besides, this bank-mutual fund relationship can cause an agency conflict between fund management company and fund investors. For instance, Mehran and Stulz (2007) and Hao and Yan (2012) demonstrate that in order for bank to keep a good relationship with their client to win the future work in other line of bank business, some banks might encourage its BR-funds to support their client's IPO stock when bank is the IPO underwriter. Hence, this bank-mutual fund relationship affects BR-funds investment constraint. The consequence of this action

causes BR-funds to lose diversification benefits and misallocate their portfolio. In addition to investment constraint, the recent literature demonstrates that risk-taking behavior of mutual funds is affected by this bank-mutual fund relationship (Wattanatorn, Nathaphan and Padungsaksawasdi 2015).

As mention earlier, the bank-mutual fund relationship affects both funds' investment constraint and outcomes. Hence, in this study, we further examine the effect of this bank-mutual fund relationship on mutual fund fee and mutual fund performance in order to answer an interesting question "do we need to pay a high fee?" To answer to this question, we study mutual fund industry in Thailand which is one of growing emerging country. Since the emerging economies demonstrate a significant growth in both economic sized and saving, subsequently calling for an attention in the global market (Kearney 2012). Thailand is one of those fast growing economies in South East Asia region. Between 2000 and 2017, Thai economics expands by about 7.38% per annum comparing with 2.47% of world GDP growth<sup>30</sup>. In the same direction, between 2000 and 2017, Thai mutual fund industry demonstrates a notable growth of 15.64% per annum<sup>31</sup>. Besides, Thailand is a bank-based economy. Most of business finances their activities by debt financing through bank loans (Prommin *et al.* 2014). This distinguish behavior of bank-based economy from the other economies and hence this distinguish allows us to explore the relationship between bank-mutual fund relationship. Based on the information advantage hypothesis, BR-funds allow to access to unpublished information (*e.g.* clients' bank loan information). Hence, BR-funds gain more insightful information about their banks' client. In addition, banks can strategically distribute their client's information with BR-funds. As a consequence, BR-funds have lower searching cost than NBR-funds. Therefore, this study employing the sample in Thailand sheds a new light on the difference in mutual fund performance and mutual fund expense between bank- and non-bank-related mutual funds.

The remainder of the study organized as follows. Section 1 addresses a related literature review. Section 2 discusses more of data and methodology used in this study. Section 3 shows empirical results. Conclusion is in the last section.

## 1. Literature review

### 1.1 Mutual fund fee

Fees charged by Asset management company (AMC) are to cover management and other expenses, *i.e.*, facilities, infrastructure, securities and market research, etc. In general, we can classify these fees into two main types. The first type is periodic fees, *i.e.*, management fee, accounting fee, custodian fee, administration fee, registration fee, selling and advertising expense. These type of fees are charged as a percentage of the size of Asset Under Management (AUM). The second type is a one-time charged fee, *i.e.*, front-and back-end loads. This one time charged fees are charged as the percentage of added investment and redemption.

The effect of mutual fund fees on mutual fund performance remains puzzle. On one hand, prior literatures document the highly active funds incur higher expense. Hence, they charge higher fees (Gruber 1996). Consistence with Gruber (1996), Grinblatt and Titman (1994) and Wermers (2000) provide the evidence to support that the positive relationship between mutual fund performance and mutual fund fee. They show that the highly active funds which charge higher fees generate superior performance than lower fund fees. On the other sides, many researchers show contradict results in which lower expense funds perform better than higher expense funds (Gil-Bazo and Ruiz-Verdu 2009, Golec 1996, Sharpe 1966).

Furthermore, the market environments affect level of fund fees charged. For example, the result of high level of competitive in the market, *e.g.* the number of funds, cause the lower funds expense ratio (Ruckman 2003). In addition, mutual fund fees vary by both internal and external factors. For external factor, the fund fees vary by the number of market sold, by the judicial system, and by the national GDP (Khorana, Servaes and Tufano 2009). For internal factor, the mutual fund fees vary by its investment objective, by countries, by its investment objectives, and by the size of funds and its fund family's size. Although the researches in mutual fund fee are documented in developed market, the evidence in emerging market is scant. Prior literatures suggest that different fund family's size has different expense ratio in Thai market. Furthermore, tax-benefit fund such as long-term equity fund (LTF) charged higher fee to their investor (Na Lamphun and Wongsurawat 2012). However, both researches ignore an importance characteristic of bank-mutual fund relationship.

### 1.2 Commercial bank and mutual funds relationship

Another important characteristic of mutual fund can be classified by their bank and mutual funds relationship. Although this relationship is significantly affecting the mutual funds' performance, there is few studies in this area.

<sup>30</sup> Source: World bank at the end of Novermber 2018

<sup>31</sup> Source: Associate of Investment Management Companies (AIMC)



Intuitively, the BR-fund and NBR-funds have difference information and investment constraints (Berzins et al. 2013, Hao and Yan 2012, Massa and Rehman 2008, Mehran and Stulz 2007).

Prior studies documented that BR-funds are more liquid than NBR-funds due to more new investment flows and lower searching cost (Nathaphan and Chunhachinda 2012, Sirri and Tufano 1998). Moreover, relationship between commercial bank and its affiliated mutual funds can cause an agency problem, which affects BR fund's investment constraints and investment outcomes. For example, Mehran and Stulz (2007) and Hao and Yan (2012) documented that a bank might encourage its affiliated mutual funds to support the client's IPO stock in order to win a future contract in another line of the bank businesses, making the mutual funds misallocate their invested portfolios and lose diversification benefits. From these differences, we would expect that the BR fund and NBR fund have a difference fund fee and fund performance.

### 1.3 Why Thailand

Research on the relationship between commercial bank and mutual funds is limited. Most evidence are studied in developed economics particularly US market<sup>32</sup>. We select the mutual fund industry in Thailand as our interest to study effect of the bank-mutual fund relationship for several reasons due to an increasing role of emerging market in the global financial system.

Firstly, Thailand is one of the important emerging markets in the South East Asia. Further, Thailand has exhibited a fantastic economic improvement. Between 2000 and 2017, Thai GDP excess the world average by about 5% per year<sup>33</sup>. Secondly, most of business in Thailand finance their activities by bank-loan (Prommin 2014). A more recent research shows that the commercial bank can affect the management of mutual fund (Charoenrook and Pavabutr 2017). Hence, they support the relationship between bank-mutual fund in Thai market. This allows us to examine whether BR-funds are granted a privilege to access to the bank's unpublished information as proposed by the information advantage hypothesis.

Further, banks can potentially pass through information advantage to their related mutual funds.<sup>34</sup> In addition, mutual fund investors make investment decision based on information available to them. As a consequence, BR-funds have lower information searching cost attract a larger positive funds flow than NBR-funds<sup>35</sup> making themselves a less liquidity constraint. In sum, we question the relationship between the bank-mutual fund relationship on the mutual fund performance and mutual fund expense.

## 2. Methodology

### 2.1 Data

We gather mutual fund data and market data from Thomson Datastream database. The weekly data of mutual fund including Net asset value weekly Total asset under-management, and net flow are obtained from the Lipper database which is a part of Thomson Datastream. In addition, we use annual reported net expense ratio to represent mutual fund fees. We use 1-year government bond to proxy for market risk free which is acquired from the same data source. The weekly stock index is obtained from the Stock Exchange of Thailand (SET). Due to the limited data of mutual fund fees, our sample includes the period between January 2008 and November 2016. To gain the international comparison, we classify fund investment objective based on Lipper global fund classification<sup>36</sup>. Lipper classifies investment objectives into equity fund, mixed assets fund, bond fund, real estate fund, money market fund, commodity fund, alternative fund.

We follow Hao and Yan (2012), and Berzins, Liu, and Trzcinka (2013) procedure in order to classify mutual fund into BR fund and NBR-fund. First, we obtain a list of commercial bank in Thailand from Bankscope. We then match the name of AMC and commercial bank in our list. If the name of AMC match with the name in a list of

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<sup>32</sup> Massa and Rehman (2008), Mehran and Stulz (2007), Hao and Yan (2012), and Berzins, Liu, and Trzcinka (2013) find that bank-related funds outperform nonbank-related funds in US market.

<sup>33</sup> Source: World Bank as of 30 November 2018. GDP growth in Thailand is about 7.38% between 2000 to 2017 while that of the world economics grows by 2.47%

<sup>34</sup> Information advantage hypothesis argues that BR-funds possess superior information. Banks can share clients' information obtained from the banks' activities with their affiliated mutual funds. Hence, BR-funds benefit from informational advantages in several ways. First, they gather information at a cheaper cost. Second, they can get unpublished information available only at their banks such as lending information (Massa and Rehman 2008, Mehran and Stulz 2007, Hao and Yan 2012, and Berzins, Liu, and Trzcinka 2013). Lastly, bank-related funds privileged advantage of receiving the IPO allocation when their affiliated bank is an IPO underwriter (Ritter and Zhang 2007).

<sup>35</sup> Sirri and Tufano (1998) and Frye (2001) show that the searching cost cause has a negative effect on fund flows. Thus, this lower searching cost of BR-funds attracts a larger fund flow.

<sup>36</sup> See more detail in Lipper Global Fund Classification (2016)



commercial bank, we simply claim that this AMC is bank-related AMC. Hence, we basically claim that mutual fund operated by bank-related AMC is bank-related fund. For AMC that the names do not match with any bank, we manually classify by using information at AMC website. We check any statement that implicitly and explicitly show a relationship between the fund and bank.

Since our primary objective is to study the mutual fund fees, we remove funds which have no data available in Thomson Datastream. In sum, at the end of November 2018, our sample includes 1,565 unique funds in which 1,193 funds are BR-funds and 372 are NBR-funds.

## 2.2 Mutual fund performance measurement

We apply two traditional performance measurement in this study. The first one is the total return and another one is Sharpe ratio. We calculate the total return from weekly NAV which is a price per share after fees of mutual fund. Hence, our total return is a good represent of the fund performance taking all fees into account. We calculate the total return for each fund as follow:

$$Total\ return_{i,t} = \frac{NAV_{i,t} - NAV_{i,t-1}}{NAV_{i,t-1}}$$

where:  $NAV_{i,t}$  is Net asset value of a mutual fund  $i$  at time  $t$  and  $NAV_{i,t-1}$  is Net asset value of a mutual fund  $i$  at time  $t-1$ . The total return measurement indicates difference in net asset value of a mutual fund across period, from period  $t-1$  to period  $t$ .

Another fund performance is Sharpe's ratio. Unlike total return, Sharpe's ratio measures the mutual fund performance in term of excess return per unit of total risk. We can call this sharpe's ratio as the reward to risk ratio. Sharpe's ratio can be calculated as the excess return of a mutual fund over a specified benchmark which we proxy by risk-free rate and divide by mutual fund total risk.

$$SH_{i,t} = \frac{E(Return_{i,t}) - Benchmark\ Return_{i,t}}{SD_{i,t}}$$

where:  $SH_{i,t}$  is Sharpe's ratio of mutual fund  $i$  at period  $t$  and  $SD_{i,t}$  is Standard deviation or risk measurement of a mutual fund  $i$  at period  $t$ .

## 3. Empirical result

### 3.1 Mutual expense

Table 1 shows a time-series of mutual fund expense ratio classified by investment objective between 2008 to 2017

Year	Annual expense ratio (%)				
	Bond	MM	Equity	MIX	Other
2008	0.854	0.418	1.653	1.339	1.796
2009	0.785	0.362	1.643	1.401	1.709
2010	0.695	0.379	1.594	1.609	1.869
2011	0.706	0.410	1.676	1.563	1.979
2012	0.687	0.382	1.724	1.602	2.260
2013	0.671	0.382	1.668	1.625	1.895
2014	0.657	0.359	1.673	1.849	1.834
2015	0.714	0.418	1.688	1.610	1.932
2016	0.676	0.412	1.709	1.795	2.068
2017	0.711	0.405	1.723	1.771	1.994
Average	0.715	0.393	1.675	1.616	1.934
STD	0.057	0.021	0.037	0.154	0.147
Growth	-1.81%	-0.33%	0.42%	2.84%	1.05%

Table 1 demonstrates the annual expense ratio of mutual fund based in our sample between 2008 and 2017. Basically, the mutual fund charges fees as the percentage of AUM. The finding shows that, between 2008 and 2017, the fixed income based funds - bond funds and MM funds slightly lower their fees charged to investor. The fixed income based funds charge fees about 0.715% per year for bond funds and about 0.393% per year for money market funds. On the other sides, the equity driven funds including Equity funds and Mixed funds increases their fees overtime. Equity funds and Mixed funds charge almost similar fees. Both funds charge about 1.6% per year. However, according to our analysis period, we find that Mixed funds increase their fees by about 2.84% per year.

The other group or alternative investment funds which include commodity funds, real estate funds, and alternative investment funds charges the highest fees to compensate their complexity. Consistence with Na Lamphun and Wongsarawat (2012), we find that the fixed income based funds have lower fees than equity driven funds. In order to compare the fees charged by different group of funds, we perform ANOVA analysis and report the results in Table 2.

Table 2. Reports ANOVA statistic test on mutual fund fees, return, total net asset, and total fund flow

Groups	NOF	Expense		Return		AUM		FLOW	
		Mean (%)	$\sigma$ (%)	Mean (%)	$\sigma$ (%)	Mean <sup>1</sup> (THB)	$\sigma^1$ (THB)	Mean <sup>1</sup> (THB)	$\sigma^1$ (THB)
Bond	325	0.734	0.070	0.044	0.002	659.86	417.49	4.84	6.96
MM	263	0.401	0.033	0.042	0.002	423.58	122.80	(0.06)	3.01
Equity	621	1.667	0.041	0.071	0.051	470.78	301.46	0.36	1.31
Mix	241	1.602	0.151	0.060	0.029	127.12	102.67	0.17	0.76
Other	106	1.746	0.468	-0.073	0.027	74.56	58.71	0.03	0.40
F-stat		91.743***		0.859		581.824***		211.584***	

1: x109 THB

Note: Expense is the annual reported expense ratio, Return is the mutual fund total return, AUM is the asset under management and is reported in billion THB, Flow is the fund flow to mutual fund and is reported in billion THB. The F-statistic are reported and \*, \*\*, \*\*\* denotes statistical significance at 10%, 5%, 1% level respectively.

Table 2 reports the F-statistic of 91.743 which overtake its critical value leads us to reject the null hypothesis of equally expense ratio for each group of funds. Then we further examine the same test on other dimensions of mutual fund including mutual fund performance, Total net asset, mutual fund flow. Although we find that each group of funds differs their expense charged, total net asset, and mutual fund flow, their performances are insignificantly difference. In addition, we find that the lowest fund performance are the money market funds. Follow by the fixed income fund. Even though both funds have a low return, both have the low level of portfolio risk comparing with equity driven funds and other funds.

Then, we further classify mutual fund into BR-funds and NBR-funds. We further conduct the mean different test between these two groups of fund and report the result as in Table 3. Our findings here show that both groups of fund charge different fees. NBR-funds charges statistically higher fees than BR-funds at aggregate level and Equity driven funds - Equity fund and MIX. The results further demonstrate that although they differ in fees at aggregate level, they charge indifferent fees for fixed income based funds and other funds.

The finding from this section recommends that the NBR-funds charges higher fees than BR-funds. Hence, our finding here consistent with that of Massa and Rehman (2008), Mehran and Stulz (2007), Hao and Yan (2012), and Berzins, Liu, and Trzcinka (2013) in that our finding supports the view of information advantage hypothesis.

Table 3. Reports mean different test of mutual fund expense between 2 groups of fund classified by investment objectives

	Full sample	Bond	MM	Equity	MIX	Other
BR	1.248	0.721	0.385	1.626	1.436	1.963
NBR	1.495	0.703	0.417	1.784	1.947	1.867
t-stat	(-9.8887)	0.5737	(-1.1188)	(-4.7652)	(-4.7132)	(0.9702)

Consistence with prior findings, BR-funds have lower expense e.g. advertising and marketing expense. Also, BR-funds offer cheaper information searching cost to their investor due to their daily activities via bank in bank-based economic. Therefore, BR-funds have lower expense ratio than NBR-funds (Nathaphan and Shunhachinda 2012). Furthermore, BR-funds offer better level of service convenience. The larger number of bank's branch allow BR-funds to offer more convenience service to mutual fund investor than NBR-funds.

### 3.2 Mutual performance

The premise in Table 2 demonstrate that although the mutual funds charge fees differ by investment objective, they generate indifferent level of return. In this section, we further scrutinize the mutual fund performance based on bank-mutual fund relationship. Table 4 reports the mean return different test between BR-funds and NBR-funds by investment objective.

Table 4. Reports mean different test of mutual fund performance between 2 groups of fund classified by investment objectives

Return	Full sample	Bond	MM	Equity	MIX	Other
BR	0.0389%	0.044%	0.043%	0.063%	0.073%	-0.070%
NBR	0.0310%	0.041%	0.038%	0.057%	0.010%	-0.042%
t-stat	(-0.432)	(0.6215)	(1.3109)	(0.3721)	(3.9157)	(-0.5627)

The findings in this section show that there is insignificant performance between BR-funds and NBR-funds among fixed-income based funds. Fixed income based fund investors are charged with similar fees and earn a similar performance between BR-funds and NBR-funds. Unlike fixed-income based funds, the MIX funds demonstrate a different picture. For MIX funds, NBR-funds significantly charge higher fees despite its generate poorer performance than BR-funds. This finding consistent with the information advantage hypothesis that the BR-funds can generate a better return. Further, the lower expense of BR-funds can reflect the economics of scale when BR-funds can share the information with their affiliated bank.

We further analyze the mutual fund performance based on sharpe ratio. Basically, the sharpe ratio is the excess return per unit of risk generated by fund. Therefore, the higher is preferred for rationale investors. Table 5 demonstrate the sharpe ratio for fund in different investment objective. We also classify fund into BR-funds and NBR-funds. The findings from Table 5 shows that, in general, BR-funds generate higher sharpe ratio than NBR-funds. It is also true for all other type of funds but other funds. We find that BR-funds generate higher sharpe ratio for Bond funds, MM funds, Equity Funds, and MIX funds. The findings in this section also support the information advantage hypothesis of BR-funds consistent with the result in previous section. In order to test the mean difference of sharpe ratio between two group of funds. We follow Ledoit & Wolf (2008) method to estimate the statistical value of sharpe ratio<sup>[1]</sup>. The statistical tests report the P-value in the bottom line of Table 5. We find a consistent result with Table 4. We find that in general, both BR-funds and NBR-funds similarly perform in all investment objectives including Bond funds, MM funds, Equity Funds, and other funds. However, for MIX funds, BR-funds outperform NBR-funds. The sharpe ratio of BR-funds is significantly higher than NBR-funds.

Table 5. Reports mean different test of mutual fund sharpe's ratio between 2 groups of fund classified by investment objectives

	Full sample	Bond	MM	Equity	MIX	Other
BR	0.0329	0.1045	0.1040	0.0295	0.0476	-0.0366
NBR	0.0239	0.0958	0.0912	0.0287	0.0084	-0.0251
p-value	0.1915	0.4518	0.1549	0.8712	0.0000	0.7151

Table 5 shows that the ANOVA test for mutual fund performance classified by investment objective. The lowest fund performance are the money market funds. Follow by the fixed income fund. Even though both funds have a low return, both have the low level of portfolio risk. While, in table 1, we find that, there are difference of mutual fund expense in each investment objective, the finding in Table 5 shows that there are insignificant between mutual fund performances for each fund categories. Therefore, our findings yield an insightful for rational investors. We find that for MIX funds, BR-funds charge significantly lower than NBR-funds. But BR-funds generate return and sharpe ratio significantly higher than NBR-funds. Hence, investor can improve their investment efficiencies by investing in BR-funds.

## Conclusion

The aim of this study is to find the answer to a straightforward question "Is it worth paying high fee?" Our finding shows that mutual fund charge fees differ by its investment objective. Basically, the fixed income based funds like bond funds and money market funds charge less than that of equity funds, mixed funds, real estate funds, commodity funds, etc. Further, since the relationship between bank and mutual fund is another important characteristic of mutual fund, our finding ascertain that this relationship affects the fees charged by mutual fund. Our findings show that although BR and NBR-funds charges similar fees for fixed income based funds, NBR-funds charge significantly higher fees than BR-funds for equity driven funds. Despite NBR-funds charge higher fees, their performance is poorer than BR-funds. Our results hi-light an important difference performance among mixed funds. We show that, for mixed funds, BR-funds charge less fees than NBR-funds. In addition to the cheaper fees, the total return and sharpe ratio of BR-funds outperform that of NBR-funds.

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## Tax Regime Shifting: What Happened to Capital Flow?

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### Abstract:

An issue of tax regime shifting from worldwide tax regime to territorial tax regime has been a primary concern from many stakeholders regarding its impact on capital outflow (Outward Foreign Direct Investment) to meet the goal of improving competitive advantage, especially those who have been experiencing saturated domestic economy. By shifting to territorial tax regime, revenue of worldwide expanding firms would not be imposed by tax from their home country. This research empirically examines whether regime shifting from worldwide tax regime to territorial tax regime drives higher expansion of domestic firms overseas in the form of capital outflow.

This research employs data of 40 countries consisting of 34 OECD countries and 6 ASEAN countries during the observation period of 2000 to 2015. In order to identify the impact of regime shifting, this research employs number of variables such as corporate income tax (CIT rate and CIT nominal) and other macroeconomic variables. The empirical result shows that tax regime shifting from worldwide to territorial regime drives higher capital outflow. That way, developed and developing economies expected higher competitive advantage for their multinational firms regionally and globally.

**Keywords:** tax system; territorial; worldwide; foreign direct investment

**JEL Classification:** C50; F21; H71

### Introduction

The world has been recognizing two types of tax regime related to capital flow (FDI *Outflow* and FDI *Inflow*) and trade for recent decades (Feld 2013). Bilateral and multilateral cooperation have been officially taken in an agreement among countries involved. The agreement provides access of trade and investment for the countries in the form of fiscal adjustments to support fair trade and higher capital flow. Therefore, many world leaders have addressed their full commitment to encourage fiscal policy adjustments to create higher domestic growth through international trade and investment. For the recent years, FDI has been rapidly increasing (OECD 2017). During 2000 – 2015, the average growth of FDI in OECD countries was 132.53%, and the average growth of FDI in ASEAN countries was 97.92% during the same periods (OECD, 2017). The increase in investment is actually triggered by the need of some countries (home countries) to expand worldwide and need of other countries (host countries) to grow rapidly. In order to drive higher competitiveness among the globe, a country prefer to embrace territorial tax regime, let alone for a country experiencing saturated domestic market economy. Territorial tax regime would drive domestic firms to invest and expand overseas. Nevertheless, for countries with growing economy and under-controlled unemployment, worldwide tax regime is preferable. There are 79.4% of OECD countries that have embraced territorial tax regime in 2015 (Dittmer 2012), while the rest 20.6% countries remained worldwide tax regime.

This research attempts to empirically analyze whether tax regime shifting (worldwide vs territorial) significantly affects both inward and outward foreign direct investment. The analysis will be guided by the following research questions.

- Does corporate income tax (CIT rate) significantly affect FDI (outflow and inflow) of multinational companies (MNC) that belong to a country embracing territorial tax regime and worldwide tax regime?



- Does corporate income tax (CIT rate) significantly affect FDI (outflow and inflow) of multinational companies (MNC) that belong to a country that shifts from worldwide to territorial tax regime?

## 1. Research Background

For the last decades, there have been numerous researches that discuss about the impact of tax regime shifting (worldwide vs territorial) to capital flow. Feld (2014) argued that tax repatriation in worldwide tax regime reduce competitiveness of multinational companies (MNC) when they make offerings to a country with lower tax tariff. It will also lead to diminishing MNCs' comparative advantage when they compete with other competitors with home country that embrace territorial tax regime. Therefore, there are number of countries, especially OECD countries, that finally decided to shift from worldwide to territorial tax regime in 2009 such as Japan, New Zealand, and the United Kingdom. By using conditional logit and mixed logit estimation techniques, it is empirically found that regime shifting leads to increase of acquisition activities (outward FDI) by Japanese and British firms overseas by respectively 31.9% and 3.9%. Japan could achieve its annual efficiency worth USD 525 million due to the regime shifting, while the United Kindom achieved USD 13.5 million efficiency. Although US still embraces the worldwide tax regime, they conducted similar simulation (exercising territorial tax regime) in the form of exemption on tax repatriation (in general worldwide tax regime requires income tax repatriation from US firms overseas). The result shows that US could generate efficiency worth USD 1,134 million (Fed *et al.* 2014). According to Huang, Marr, and Friedman (2013), tax regime shifting from worldwide to territorial provides several challenges. The first is territorial tax regime creates a larger incentive for multinational firms to invest and earn profit overseas. It is mainly due to highest imposition of tax for firms operating domestically and lowest imposition of tax for MNC operating overseas. The second is that capital outflow is more attracting, thus domestic investment would decrease and would lower the opportunity of domestic employment (due to lower wage and salary). The third is that capital outflow would create lower domestic tax revenue, leading to budget deficit. Thus, in this case, US keeps imposing taxes for their MNCs operating overseas. Decrease in state revenue drives the government to widen tax-base, therefore domestic small-medium enterprises would be at risk to be imposed by higher tax tariffs. The US policy is also confirmed by Atwood, Houston, and Wallace (2013) who expressed that MNCs could achieve RNOA (expected tax return on asset) better than domestic firms in their home countries, disregarding their tax regimes (either worldwide or territorial). Nevertheless, the expected RNOA is much higher for MNCs where home countries embrace worldwide tax regime through artificial income shifting, cross crediting, and profit allocation of holding company to its overseas source to calculate tax credit overseas compared to MNCs where home countries embrace territorial tax regime. There has been a debate regarding adoption of territorial tax regime in the US, which is worldwide tax regime does not create tax disadvantage compared to any countries embracing territorial tax regime due to effective tax calculation.

According to Dittmer (2013) there are 27 out of 34 country members of OECD that embrace territorial tax regime, and their governments are encouraged to keep doing so. Territorial tax regimes is actually a pragmatic response towards uncertainty in global competition that moves rapidly time to time. The regime is expected to improve economic performance and to generate fiscal balance as well as avoiding distortion in terms of trapped income and system compliance cost that are higher than worriedness about potential revenue. Compared to 2005, US MNCs competitiveness had diminished. The policy should have been designed to increase capital inflow back to US without holding any domestic firms who intend to invest overseas. Those firms had to invest to any destination they considered promising to earn high revenue, and it was beneficial for the US investors. Moreover, it was also beneficial in the context of domestic consumers where prices were more affordable, wages and salaries were high in the context of workers. There were arguments regarding potential loss US might suffer if the government had embraced the territorial tax regime.

Nevertheless, the above discussion may a little bit different from a research of Markle (2010). Multinational firms that domiciled in host country that embraced territorial tax regime tended to be able to earn higher revenue (with support from their affiliates overseas) compared to multinational firms that domiciled in host countries that embraced worldwide tax regime. With empirical estimation technique, it was found income shifting from country with worldwide tax regime to country with territorial tax regime were statistically different in terms of cash flow. Any multinational firms, disregarding tax regimes their home countries have embraced, hold excess cash in host countries with higher tariff on tax dividend and subsidiaries with worldwide tax regime, especially those firms that belong to US holdings that hold excess cash if there were potential tax revenues for the home country upon repatriated tax revenue. Overall regime shifting from worldwide to territorial tax regime would be accompanied that the increase in income shifting by most of the firms except those who consistently reinvested their revenue overseas in the country they currently domicile in.



Therefore, specific factor that will influence capital flow is tax tariff set by host country. Matheson et al (2013) has focused on examining the impact outward FDI of the United Kingdom (that embraces territorial tax regime) and the United States of America (that embraces worldwide tax regime). The research employed fixed effect model to measure whether corporate income tax, dividend tax, and interest income tax significantly affected multinational firms where their home countries embraced territorial tax regime. The result revealed that the higher the corporate income tax (in host country), the lower the capital outflow (both funded by equity and retained earnings) from countries that embraced territorial tax regime by USD 206 million, which is in this case the outward FDI from the United Kingdom. Moreover, the increase in tax tariff cut on dividend would drive lower outward FDI from the United Kingdom by USD 168 million. The interesting point is that corporate income tax tariff performed no significant impact on countries that embraced worldwide tax regime, such as the United States of America. It expresses that imposition of tax in destination country (host country) have significant impact on multinational firms where the home countries embrace territorial tax regime.

There has been an increase in interest of many countries worldwide to implement combined taxation regimes (double taxation), which is in general conducted by developed and developing countries (pairing) in a particular tax treaty. Azemar and Delios (2007) examined the impact of tax sparing (combined territorial and worldwide tax regimes) on capital outflow from Japan and France on 54 developing countries during the period of 1990 to 2000. The research employed Poisson regression model to analyze the impact of tax sparing on capital outflow from Japan (that embraced worldwide tax regime until 2000) and from France (that embraced territorial tax regime) to developing countries. The result shows three important implications. The first is the difference between investors' sensitivity would diminish due to tax sparing policy on the tax treaty between the two countries. The second implication tax sparing has significant impact regarding investment decision of Japanese and France multinational firms in terms host countries (destination to invest). The third implication is that tax sparing policy would make investors no longer take tax incentive into account as consideration to invest.

There are many countries that drive tax incentives to attract more capital inflow to their countries. Nevertheless, the effectiveness of tax incentive is strongly influenced by tax regime of the home country. Therefore, many countries come up with tax sparing policy in their tax treaty in order to make home countries recall their tax incentive policy. It is mentioned in Azemar and Dharmapala (2015) who analyzed investment of 23 OECD countries on 113 developing countries and transition countries during 2002 until 2012. The research employed fixed effect model which performed two important implications. The first implication tax sparing policy would increase investment agreement by 30%, and tax sparing policy is the most important factor behind the agreement on developing countries, either embracing worldwide or territorial tax regime.

In connection with the above findings, then size of nominal FDI would rely much on the tariff set in the tax system. Coelho (2010) conducted a research about the impact of tax tariff on inward FDI of 9 OECD countries with different characteristics within 7 years. The research applied pooled least square estimation technique with BEATR (Bilateral Average Tax Rate) as independent variable. The result shows that particular tax system did not significantly affect FDI. Instead, it was tax tariff that performed significant impact where 1% increase in tax tariff would decrease inward FDI by 4.2% in the long-run.

There are number of important determinants besides tax tariff on capital flow (inward and outward FDI), which are treated as controlling variables in this research. The first is research from Tsuchiya (2015) that revealed FDI inflow was influenced by GDP, GDP Percapita, and Infrastructure in India (highway). Moreover, research from Kariuki (2015) revealed that economic risk, commodity price index, world stock market index, gross fixed capital formation, and openness to trade are significant factors of FDI in African Union. In addition, Akpan *et al.* (2014) argued that GDP, infrastructure, and openness to trade are significant determinant behind FDI in BRICS (Brazil, Russia, India, China, and South Africa) and MINT (Mexico, Indonesia, Nigeria, and Turkey). In the context of Turkey, FDI is significantly affected by GDP, openness to investment and trade, energy production, labor productivity, and inflation (Kalyoncu *et al.* 2015). In the case of Vietnam, Thanh Hoa province, FDI is strongly affected by natural resources, infrastructure, and financial services (Huyen 2014). In the case of European Union (EU), unemployment rate (Strat *et al.* 2014) and unit labor cost and market size (Bevan and Estrin 2004) also played significant role behind investors' decision. Besides the above mentioned macroeconomic factors, Hajkova *et al.* (2006) argued that business trend also played important role on FDI in OECD countries.

## 2. Methodology

In order to analyze the impact of tax regime on capital flow (inward and outward FDI), this research employs multiple linear regression which is preceded by model specification tests (Chow, LM, and Hausman Tests), simultaneous test, *goodness of fit*, and robustness test. This research analyzed data collected from 40 countries consisting of 34 OECD countries and 6 ASEAN countries during 2000 to 2015. The data is collected from various sources such as IMF database, World Bank, Global Competitiveness Index, and Human Development Index Report. In details the data sources are exhibited in the following Table 1.

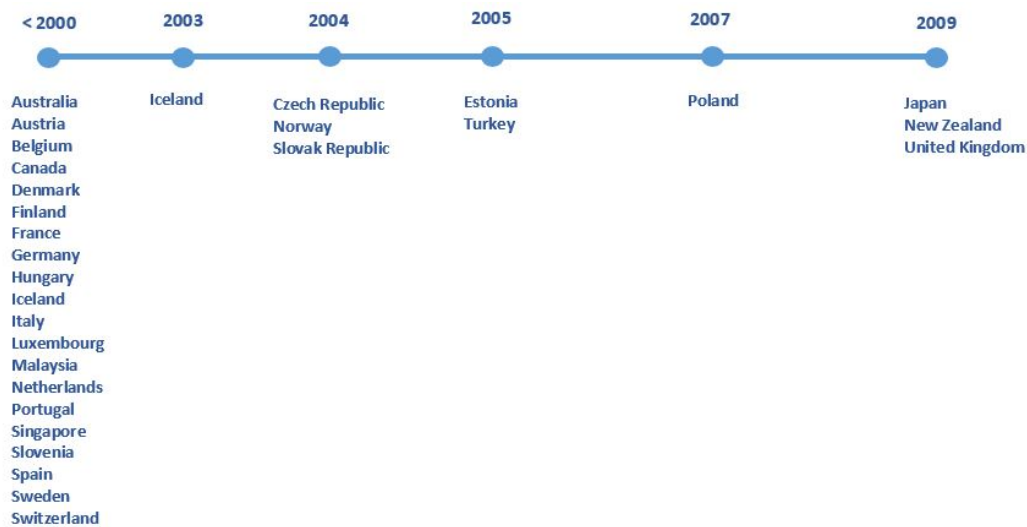
Table 1 Data and variables

Variables	Description	Unit	Source
cit	Corporate Income Tax	Nominal USD	IMF Database
cit_rate	Corporate Income Tax Rate	Percentage	IMF Database
gdp_g	GDP Growth	Percentage	World Bank
inflation	Inflation	Percentage	World Bank
labor	Labor	Nominal	World Bank
unemp	Unemployment	Percentage	World Bank
export	Export Value	Nominal USD	World Bank
import	Import Value	Nominal USD	World Bank
cons	Consumption Value	Nominal USD	World Bank
pop	Population	Nominal	World Bank
hdi	HDI	Index	World HDI Report

Source: Author's Tabulation (2017)

This research accessed data from 40 countries consisting of 34 OECD countries and 6 ASEAN countries. Figure 1 below shows each period particular country decided to either shift from worldwide to territorial tax regimes or remained worldwide tax regime.

Figure 1. Research samples (based on tax regime)



Source: Author's Summaries (2017)

The result is exhibited based on category provided in Table 2 as well as the result of each country's statistical output. The combination of model is exhibited in the following table.

Table 2. Combination of empirical model

Tax Regimes	Periods	Countries
Overall	2000	40
	2015	40
Territorial	2000	19
	2015	29
Worldwide	2000	21
	2015	11

Source: Author's Tabulation (2017)

Basic empirical model this research refers to is exhibited by the following model (1):

$$y_{it} = \beta_0 + \sum_{i=1}^n \beta_j X_{it} + \varepsilon_{it} \tag{1}$$

where:  $y_{it}$  dependent variable of unit  $i$  at time  $t$ ;  $\beta_0$  is constant, and  $\beta_j$  is coefficient  $j$  of each variable, and  $X_{it}$  is independent variable of unit  $i$  at time  $t$ , while  $\varepsilon_{it}$  adalah error terms. Therefore, the empirical model of this research can be expressed as follow.

$$fdi_{it} = \beta_0 + \beta_1 cit_{it} + \beta_2 dwt_{it} + \beta_3 citdwt_{it} + \beta_4 iwt_{it} + \beta_5 gdp_{it} + \beta_6 gdppc_{it} + \beta_7 pubinst_{it} + \beta_8 haven_{it} + \beta_9 eds_{it} + \beta_{10} hdi_{it} + \varepsilon_{it} \tag{2}$$

where:  $fdi_{it}$  is outward foreign direct investment (OFDI) of country  $i$  at time  $t$ . Moreover  $cit_{it}$  is CIT rate of home country  $i$  at time  $t$ . Meanwhile  $dwt_{it}$  is dividend withholding tax (tax imposed to shareholders after realization of dividend) of country  $i$  at time  $t$ . The next is  $citdwt_{it}$  as the accumulation of CIT rate and DWT rate\*(1-CIT) of country  $i$  at time  $t$ . Moreover  $iwt_{it}$  is interest withholding tax of country  $i$  at time  $t$ . Meanwhile  $gdp_{it}$  is GDP nominal in US\$ billions of country  $i$  at time  $t$ . The next is  $gdppc_{it}$  as GDP per capita denominated in US\$ billions of country  $i$  at time  $t$ . Moreover  $pubinst_{it}$  is political stability index from World Bank of country  $i$  at time  $t$ . The next one is  $haven_{it}$  is tax haven dummy that refers to Dharmapala and Hines, 2009, excluding Ireland). Moreover  $eds_{it}$  is index of ease of doing business of country  $i$  at time  $t$ , and  $hdi_{it}$  is human development index of country  $i$  at time  $t$ .

### 3. Discussion

This research employs panel data estimation for period 2005 to 2015 on quarterly basis. The data is analyzed using multiple linear regression of fixed effect model obtained from model specification tests. In order to decide which empirical model best to use, this research initially conducted Chow Test, LM Test, and Hausman Test on six empirical models. The six models are actually derived from two main models which are inward FDI and outward FDI models. Each of those two models have three different models consisting of samples of overall 40 countries, model of countries with worldwide tax regime, and model of countries with territorial tax regime. The result of model specification tests is exhibited by the following Table 3.

Table 3 Model specification tests

Empirical Model		Chow Test	LM Test	Hausman Test	Output
FDI Inflow	Mixed	0.0000	0.0000	0.0000	Fixed Effect
	World	0.0000	0.0000	0.0000	Fixed Effect
	Terr	0.0000	0.0000	0.0000	Fixed Effect
FDI Outflow	Mixed	0.0000	0.0000	0.0000	Fixed Effect
	World	0.0000	0.0000	0.0000	Fixed Effect
	Terr	0.0000	0.0000	0.0000	Fixed Effect

Note. Mixed = model with overall 40 countries, World = model of countries with worldwide tax regime, and Terr = model of countries with territorial tax regime

Source: STATA 13

After conducting model specification tests, the next step is to analyze the data using fixed effect model. In general, the research is trying to identify whether tax regimes (worldwide vs territorial) would either attract capital inflow to the country or drive capital outflow from the country. In this research, dummy variable is employed where countries with territorial tax regime will be 1, and countries with worldwide tax regime will be 0. Table 4 provides the empirical output.

According to the empirical output exhibited in Table 4, it can be concluded that:

- For group of countries with territorial tax regime, corporate income tax (nominal and tariff) have significant impact on capital inflow (inward FDI). Nevertheless, it does not perform significant impact on capital outflow (outward FDI), in terms of both nominal and tariff, from both territorial and worldwide tax regime countries.
- For group of countries with worldwide tax regime, corporate income tax (nominal and tariff) does not perform significant impact on both inward FDI and outward FDI.
- For all countries (samples) model, corporate income tax (in territorial and worldwide tax regime countries) performs significant impact on both inward FDI and outward FDI.

Table 4. Empirical output

Variables	FDI Inflow			FDI Outflow		
	mixed	World	Terr	mixed	world	terr
Cit	0.382 (0.032)	0.153 (0.457)	0.597 (0.022)	-0.029 (0.863)	-0.202 (0.341)	0.136 (0.559)
cit_ter	-0.192 (0.002)	-0.450 (0.400)	-0.181 (0.055)	-0.128 (0.028)	0.012 (0.983)	-0.076 (0.367)
cit_rate	-1.127 (0.017)		-1.609 (0.031)	-1.574 (0.000)		-1.777 (0.008)
cit_rate_ter	1.202 (0.006)		1.166 (0.067)	0.852 (0.035)		0.509 (0.371)
gdp_g	0.158 (0.001)	0.157 (0.048)	0.149 (0.012)	0.228 (0.000)	0.143 (0.080)	0.191 (0.000)
Inflation	0.091 (0.061)	-0.026 (0.708)	0.117 (0.062)	0.097 (0.031)	0.113 (0.122)	0.071 (0.205)
Labor	0.122 (0.952)	-1.931 (0.401)	2.915 (0.338)	2.448 (0.196)	0.278 (0.906)	1.848 (0.498)
Unemp	-0.060 (0.723)	0.119 (0.572)	-0.016 (0.947)	-0.486 (0.002)	-0.102 (0.637)	-0.902 (0.000)
Export	-0.177 (0.762)	0.157 (0.825)	-0.365 (0.658)	1.018 (0.063)	1.353 (0.066)	0.937 (0.204)
Import	0.290 (0.664)	-0.130 (0.871)	0.534 (0.571)	0.118 (0.849)	0.392 (0.637)	-0.216 (0.799)
Cons	0.736 (0.087)	1.549 (0.005)	0.445 (0.452)	0.431 (0.283)	0.735 (0.194)	0.357 (0.500)
Pop	-0.039 (0.988)	-2.071 (0.560)	-1.555 (0.677)	-6.495 (0.010)	0.568 (0.876)	-8.102 (0.016)
Hdi	-1.168 (0.703)	4.032 (0.302)	-9.306 (0.051)	-0.703 (0.806)	-6.173 (0.126)	3.934 (0.355)
_cons	-5.457 (0.805)	47.121 (0.148)	-23.213 (0.413)	53.830 (0.009)	-53.009 (0.114)	99.568 (0.000)
R-square	0.2009	0.5066	0.1342	0.3617	0.5970	0.3206
F- stat	11.64	15.78	5.03	26.24	22.76	15.32
Prob – F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: STATA 13

The basic reference of the analysis is model with overall countries included (worldwide and territorial). The empirical findings above expresses that the increase in corporate income tax would drive higher inward FDI, where 1% increase in corporate income tax (nominal) would increase capital inflow by 0.382% with 5% level of significance. The reason behind this finding is the increase in corporate income tax a firm has to pay reflects the increase in earnings before tax (EBT). It actually indicates that investment in those countries has positive prospect in the long-run, at least from business environment and market points of view. Nevertheless, if the increase occurs in tariff (instead of nominal tax a firm has to pay), then 1% increase in corporate income tax would drive lower FDI by 1.127% with 5% level of significance. Moreover, if those countries shift from worldwide to territorial tax regime, then it would decrease inward FDI by 0.192% with 1% level of significance. Nevertheless, if the increase occurs in tariff (rate), then inward FDI would instead increase by 1.202% with 1% level of significance.

The reason behind those findings is the perception of investors that they would compete with other multinational firms. This assumption is driven by the fact that any countries embracing territorial tax regime would drive their investors to expand overseas, to a country the firms might compete with. Therefore, it would be considered as disincentive towards the firms' intention invest in those countries.

Moreover, from outward FDI points of view, it is seen that corporate income tax nominal does not have significant impact on outward FDI from home countries. Nevertheless, if the increase occurs in tariff (tax rate) by 1%, there will be decrease in outward FDI by 1.574% with 1% level of significance. Moreover 1% increase in nominal corporate income tax would drive lower outward FDI by 0.128% with 5% level of significance. This finding reflects that the increase nominal corporate income tax a firm has to pay is the increase in earnings before tax/EBT. It indicates higher productivity when those firms operate domestically. It can be viewed from revenue or cost efficiency. Nevertheless, if there is 1% increase in tariff of corporate income tax of home countries with territorial

tax regime, then there will be increase in outward FDI by 0.852% with 5% level of significance. The increase in tariff would be an additional burden for the firms if they decided to operate domestically. With the opportunity of not being imposed by home country tax regime, then it will drive investors (both individual and institutional) expand and invest overseas.

According to the above Table 4. the negative and significant impact of corporate income tax (in territorial tax regime countries) on outward FDI is not supporting research of Matheson et al (2013) who argued that capital outflow from the United Kingdom and Japan tends to decrease if those countries embrace territorial tax and increase the tariff. In detail, the output of this research is better than Matheson et al (2013), as coefficient determination of this research is 0.3617, higher than Matheson *et al.* (2013) by 0.220. Higher coefficient determination is driven by longer period of observation (2000 – 2015) and larger sample units (40 countries). Moreover, empirical findings regarding the impact of corporate income tax on inward FDI is in line with research from Coelho (2010) examining 9 OECD countries with 7 years observation period. In his research, Coelho (2010) found that the increase in tariff of corporate income tax would drive lower inward FDI to the countries.

Referring to empirical findings of macroeconomic and social factors, it is found that GDP growth has positive and significant impact on inward and outward FDIs. Considering the host countries, economic growth strongly indicates improvement in economic activities, higher productivity, and higher purchasing power. It appears as huge opportunity in terms of potential market to access and potential cost efficiency to make. Moreover, considering home country (investors), then economic growth indicates high opportunity for the countries to increase their productivity by overseas expansion. In economic science, a country would experience saturated economy if all production factors have reached their optimum performance. Therefore, it is necessary to expand overseas, especially for developed countries. For instance, the largest investors in Indonesia are Singapore, Japan, and China which are saturated economy.

Besides that, inflation also plays important roles as the increase in aggregate price would lead to the increase in both inward and outward FDIs. It can be viewed from two perspectives. The first from inward FDI points of view, where inflations are considered to be potential higher revenue for the firms, while the second is outward FDI indicating inflation as the symptoms of higher production cost. What makes it interesting is that consumption tends to drive higher capital outflow. In the other hand population would decrease capital outflow. When it comes to human capital, the increase in human development index (HDI) tends to decrease capital inflow to those countries, as the labor cost would be more expensive for investors is they invested in country with high quality of human capital.

## Conclusion

This research attempts to provide accurate analysis regarding impact of corporate income tax (nominal and tariff) of countries that shifted their tax regime from worldwide to territorial tax regime on capital flow (outward and inward capital flow). This research used data from 40 countries consisting of 34 OECD countries and 6 ASEAN countries. The observation period is 2000 until 2015. In order to measure the impact, this research employed multiple regression of fixed effect model. Some important findings are:

- For group of countries with territorial tax regime, corporate income tax (nominal and tariff) have significant impact on capital inflow (inward FDI). Nevertheless, it does not perform significant impact on capital outflow (outward FDI), in terms of both nominal and tariff, from both territorial and worldwide tax regime countries.
- For group of countries with worldwide tax regime, corporate income tax (nominal and tariff) does not perform significant impact on both inward FDI and outward FDI.
- For all countries (samples) model, corporate income tax (in territorial and worldwide tax regime countries) performs significant impact on both inward FDI and outward FDI.

Besides there are number of macroeconomic indicators that play significant role on capital flow. Economic growth has significant and positive impact on capital flow (both inward and outward FDI). Unemployment and population will decrease capital outflow as investors consider there would be future prospects to operate inside the country in the form of job creation. Moreover, consumption will increase FDI inflow as investors consider it as potential higher revenue in the long-run. And the last is the quality of human capital tends to decrease capital inflow as investors considers it as additional cost to pay high quality human capital in a particular country (where quality of human capital is high) if they decide to invest.

The empirical findings of this research show that corporate income tax has significant impact on capital flow, particularly for countries that shifted from worldwide to territorial tax regime. For countries with saturated economy, the regime shifting from worldwide to territorial will be strongly relevant to increase global competitiveness, as



investors would expand overseas. In regards with the aim to improve competitiveness, decision makers should be able to set optimum tariff relative to tax tariff set by home country (that also embrace territorial tax regime) where competitors belong to and relative to tax tariff of host countries (investment destination).

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# Political Cycles in the United States and Stock Market Volatility in other Advanced Economies: An Exponential Generalised Autoregressive Conditional Heteroscedasticity (EGARCH) Approach

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## Abstract

This study investigates US political cycles and the impact, thereof on stock market volatility in advanced economies (Canada, France, Germany, Italy, Japan, Switzerland and the UK.) using monthly data over the period January 1921 to December 2017. Overall, the results indicate that the type (Democratic or Republican) of presidential administration does play a role in the behaviour of stock returns, and volatility, but the results and direction of the impact are sample specific. In general, the results tend to suggest an increase in returns and volatility of other stock markets when there is a democratic government in the US.

This study suggests that there is a need for market participants to start analysing the trajectory of a certain election, beginning at the proposed event window, in order to manage their risks and be at a stable position during these periods of uncertainties.

**Keywords:** US political cycles; stock returns and volatility; advanced economies; asymmetric GARCH models

**JEL Classification:** C32; G10

## Introduction

The dynamic relationship between politics and financial markets has been a growing debate among academics since the late 1970's. A substantial number of studies have attempted to explore the role in which politics play in shaping the direction investors take amid political uncertainty, economic turmoil and presidential elections as well as examining the effect of politics on the volatility of stock market returns ( see, Niederhoffer *et al.* 1970, Santa-Clara and Valkanov 2003, Booth and Booth 2003, Li and Born 2006).

The analysis of the impact of political cycles on stock market returns has been almost exclusively conducted in the United States and indicates that presidential elections in the US do affect the stock market mean return and volatility (see, Pantzalis, Stangeland, and Turtle 2000; Bialkowski, Gottschalk, and Wisniewski 2007, Wong and McAleer 2009). The joint study of the G6 countries and Switzerland stock markets have received less attention in existing literature. Consequently, the present study complements the existing literature by investigating the transmission of shocks from the US to the sample countries used in the study. Against this backdrop, the objective of this paper is to examine the existence, if any of abnormal stock market returns in the US stock market and the sample countries stock markets with a view of analysing the impact of presidential administrations on stock market prosperity and volatility. The next sections will discuss the empirical literature, describe the methodology, present the data, present the estimation and discussion of main results and conclude the paper.

## 1. Literature review

Theoretically, there are several channels to explain how politics could affect the stock market known as the Political Business Cycle (PBC) theory formalised by Nordhaus (1975). PBC theory explores the politically oriented models of business cycles by studying the main factors that depend on public policy and determine the fluctuations of gross domestic product (GDP). The empirical results of PBC theory suggest that the main macroeconomic indicators (GDP, investment, inflation, exchange rate) adjust prior to the elections, in the election year and in the period after the elections (Rogoff and Sibert 1988).

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In the PBC literature, two schools try to explain how the political process induces cycles in stock market performance namely the opportunistic PBC theory and the partisan PBC theory (formalised by Hibbs 1992). The opportunistic PBC theory postulates that the incumbent government uses expansionary policy measures to improve the economic situation just before an upcoming election with the main aim being to increase stock prices and therein to win votes. In contrast, another channel through which politics influence asset prices is the inherent uncertainty of different governmental policies and consequently in stock price behaviour, formally known as the Partisan PBC theory. Therefore, differences in the ideological composition of governments will be reflected in economic policies and, as a consequence, in stock returns behaviour.

Empirically, several studies have documented the effect of political uncertainty caused by upcoming presidential elections on stock market returns and volatility (see, Pantzalis *et al.* 2000, Santa-Clara and Valkanov 2003, Booth and Boot 2003, and Pastor and Veronesi 2012 for detailed reviews). Leblang and Mukherjee (2005) focusing on the US and British stock markets analysed empirically the effects of different parties holding office on volatility and found that increasing electoral prospects of a right-leaning coalition trigger volatility increases. The results show that higher uncertainty about the electoral outcome increases market volatility. Li and Born (2006) investigated the effects of US presidential election uncertainty on volatility in daily stock market returns. Their measure of election uncertainty included dummy variables based on the differences in poll numbers for the two major party candidates from the end of the party conventions up to election day for US presidential elections between 1964 and 2000. Using a GARCH model, their findings suggest that elections resulted in greater volatility in the daily return of the Center for Research in Security Prices (CRSP) value-weighted index.

In another study focusing on the US, Pástor and Veronesi (2017) developed a model of political cycles in which the presidential puzzle emerges endogenously. They showed that theoretically when risk aversion is high, voters are more inclined to elect a Democratic president because they demand more social insurance. In contrast, when risk aversion is low, a Republican president is likely to be elected because the voters have a greater business risk tolerance. Hence, greater risk aversion under Democrats implies that investors want to be compensated for high-risk portfolios through higher average stock market returns. The authors, using post World War II, data shows that average return is higher under a democratic government for Australia, Canada, France, Germany and the UK.

In a study focusing on Japan, Lin and Wang (2005) examined the response of Nikkei 225 stock market to the transition of ruling party in Japan. The study employed an EGARCH model to explore the dynamic relationship between financial market reaction and political behaviour in Japan and found that the transition of ruling party effect is not a crucial variable to Nikkei 225 returns and volatility.

In a slightly different manner, Demirer and Gupta (2018) investigated the existence of correlations between the US stock and government bond returns for the period spanning from September 1791 to December 2017. Using a dynamic conditional correlation generalized autoregressive conditional heteroskedasticity (DCC-GARCH) model, the results showed that Democratic administrations are generally associated with lower degree of comovement between the stock and government bond return. The results also corroborate the existing empirical literature relating to the effect of presidential cycles on stock market returns support evidence that a Democratic party is most likely to be elected when risk aversion is high.

A point of departure from the empirical literature is a study by Yi-Hsien, Mei-Yu, and Che-Yang (2008) in which the authors analysed the US Presidential election and concluded that the effect of presidential elections on stock markets depend on the individual presidents themselves, the general policies the winning parties and nature of the market. On the other hand, Dopke and Piedzoch (2006) challenge the view that political factors have a significant impact on equity returns in their study examining the interaction of stock market movements and politics in Germany. The authors do not find evidence that the German stock market returns are higher during liberal than during conservative governments. Also, in contrast to results for the US (Santa-Clara and Valkanov 2003), the results show no evidence for an election cycle in German stock market returns.

Based on the analysis of empirical literature, it is evident that the debate about the effect of presidential cycles on the behaviour of financial markets is a two-fold. On one hand, a substantial amount of academics document that the outcome of an election depends on how low or high is risk aversion and how investors relate to the size of prevailing risk. In contrast, a significant few studies refute the existence of a significant presidential cycle effect on stock market returns. Our analysis essentially builds on the work of Pástor and Veronesi (2017) by studying the impact of US presidential elections on not only stock returns but also volatility of advanced economies, based on long-samples of monthly data, which for some countries stretches over a century. Long data samples allows us to guard against sample selection bias and also helps us to study the entire historical evolution of these markets associated with the US presidential cycles.

## 2. Methodology

Volatility is associated with unpredictability, uncertainty and has implications for variance risk. Generally, volatility is viewed as a symptom of market disruption whereby securities are not fairly priced, and the capital market is not functioning efficiently. In addition, changes in the volatility of stock market returns are capable of having significant negative effects on risk averse investors and the economy (Tanizaki and Hamori 2009). In order to decompose stock returns into expected returns and returns shocks to see the behaviour of stock market returns when a Democrat president is in office, a dummy variable is embedded in the mean returns equation (1) and in the volatility equation (2) as follows:

$$R_t = \alpha + \beta R_{t-1} + \theta R_{US} + \gamma_1 D_t + \varepsilon_t \quad (1)$$

where  $D_t$  equals one when it corresponds to a Democrat administration, otherwise equals zero.

### 2.1. GARCH Model

The EGARCH model proposed by Nelson (1991) is the logarithm of the conditional variance, which means that the restrictions on the parameters to ensure  $h_t > 0$  are no longer required. The error term  $u_t$  is assumed to be normally distributed with a mean of zero, and a variance that follows an EGARCH (p, q) process as presented below:

$$\log(h_t^2) = \omega_0 + \phi \log(h_{t-1}^2) + \psi \left| \frac{u_{t-1}}{h_{t-1}} \right| + \lambda \frac{u_{t-1}}{h_{t-1}} + \gamma_2 D_t \quad (2)$$

where:  $\omega_0$  is the constant term of the variance equation,  $u_{t-1}$  represents the lag value of the error term from the mean equation and  $h_{t-1}^2$  is the lagged  $h_t$  term. Volatility persistence is captured by  $\phi < 1$ .

The presence of asymmetric (leverage) effect is examined by testing the hypothesis that  $\lambda < 0$ . The impact is asymmetry if  $\lambda \neq 0$ . The model employed is motivated by Lin and Wang (2005) who used the proposed model to examine the impact of change in government office administrations on the stock return mean and stock market volatility.

## 3. Data

The dataset used in the study is obtained from the Global Financial Database, with the start and end dates driven by data availability, and it covers the sample period January 1921 to December 2017, totalling 1164 observations. The data is comprised of monthly stock returns, and is defined in terms of natural logarithms as:

$$r_t = \log(P_t) - \log(P_{t-1}) \quad (3)$$

where:  $r_t$  is the current continuous compounded returns,  $P_t$  is the current month opening stock price index and,  $P_{t-1}$  is the previous month opening stock market index.

Specifically, in order to examine the level of volatility between different stock exchanges, the following indices were used; Nikkei 225 index (proxy for Japan), the London Financial Times-Stock Exchange (FTSE) All Share Index (proxy for the United Kingdom), the S&P/TSX 300 Composite Index (proxy for Canada), CDAX Composite Index (proxy for Germany), CAC All-Tradable Index (proxy for France), Banca Commerciale Italiana Index (proxy for Italy) and the Swiss stock market index (proxy for Switzerland). In addition, the study makes use of data on the presidential cycles from <http://www.enchantedlearning.com/history/us/pres/list.shtml>. This information is used to create a dummy that captures presidential cycles, taking a value of one for months during which a Democratic president was in office and zero otherwise.

The current study employed monthly data as opposed to daily data, mostly used in most finance literature because daily data is usually noisy (Worthington and Higgs 2004). Another important concern that arises from the use of daily data, is that financial markets in different continents operate at different times. This difference in trading hours among international stock markets has important implications for the interpretation of results and model specification. Furthermore, monthly data makes it easier to identify changes in trends.

## 4. Estimation and Discussion of Results

This section presents the various estimation results of the methodology adopted to address the objectives of this study, as well as a discussion of the results. The present section is organised and presented in two sub-sections. The first sub-section begins with the presentation and the analysis of descriptive statistics. The last sub-section

provides the results from the ARCH family of models used in modelling the transmission of volatility and the variation in stock market mean returns.

#### 4.1. Descriptive Statistics

This section deals with the preliminary results by highlighting the basic statistical properties for all the stock markets considered over the study period.

Table 1 depicts the monthly percentage change in stock market returns and a snapshot of the volatility in returns at its highest. France has the largest unconditional monthly stock market return (mean value) followed by Japan, whereas the Switzerland has the lowest mean change in mean returns. Moreover, Germany has the highest stock market returns volatility as demonstrated by the high unconditional standard deviation, followed by Italy and Japan indicating the existence of more risk in the stock markets than other stock markets. It can be seen from the table that the maximum and minimum values highlight the high level of volatility in return. The descriptive statistics show the characteristics common with most financial data, such as non-normality. For instance, the skewness statistic shows that more observations are distributed to the left for other stock markets, except for Japan and Italy. Furthermore, the kurtosis statistic shows that the distribution of observations is not a normal distribution, it is platykurtic. As a result, the Jarque-Bera test reports a departure from normality. Figure A1 in Appendix A presents a graphical illustration of monthly stock market returns performance for the selected G6 countries and Switzerland during the sample period.

Table 1. Descriptive statistics for all stock markets from 1921-2017

Country	Japan	UK	Germany	Italy	France	Canada	Switzerland
Mean	0.579869	0.439484	0.424398	0.564046	0.630321	0.422538	0.379627
Median	0.562696	0.799103	0.426659	0.170810	0.783672	0.750468	0.607161
Std. deviation	6.031987	4.633135	8.125173	7.123629	5.503222	4.599101	4.337185
Maximum	50.87177	42.31970	68.87212	46.81052	24.25479	20.58906	28.77728
Minimum	-27.21623	-30.92406	-145.9963	-30.75734	-27.60538	-33.4603	-28.21567
Skewness	0.599	-0.151	-4.73	0.916	-0.148	-1.073	-0.492
Kurtosis	10.227	12.304	103.48	8.673	4.337	8.754	8.165
Jarque Bera	2602.57*	4203.63*	494031.7*	1723.85*	91.019*	1829.51*	1340.87*

Note: \* significance at 5% level. Source: Authors computation

#### 4.2. Testing for ARCH effects

In order to determine empirically whether there is presence of volatility clustering, or otherwise in the data series, the Ljung-Box test for autocorrelation, and the Engle (1982) Lagrange multiplier (LM) test for heteroscedasticity, are conducted by regressing the residuals from the mean equation on its own lags. The Ljung-Box Q-statistic is defined as:

$$Q = n(n+2) \sum_{k=1}^m r_k^2 / n - k \quad (4)$$

where:  $n$  is the sample size,  $k$  is the lag length,  $m$  is the maximum lag length and  $r_k^2$  is the autocorrelation coefficient at lag  $k$ . The  $Q$  statistic is a Chi-square distribution, where the null hypothesis is that all  $r_k^2$  are zero and the alternative is that at least some are significantly different from zero (see Ljung and Box 1978).

On the other hand, the Engle (1982) LM test for ARCH effect is computed as:

$$LM = T * R^2 \quad (5)$$

where:  $T$  is the sample size, and  $R$ -squared is the goodness-of-fit, derived from the mean equation. The test statistic for the LM test also follows a Chi-square distribution, and the null hypothesis is that there are no ARCH effects.

This study makes use of only 15 lags of the residuals from the mean equation to jointly test for serial correlation using the Ljung-Box statistic, while the LM test is conducted on individual lags up to lag 3. The decision as to whether there is presence of volatility clustering in a given stock market, or otherwise, is based on the outcome of the Ljung-Box and LM tests results, though much weight is attached to the LM test. The empirical results of these tests on different lags are presented in Table 2.

Evidence from the ARCH Test results and from the LM test indicate that all stock market returns series show significant ARCH effects. Thus, it can be concluded that there is evidence of time-varying volatility. Furthermore,

the Ljung-Box test fails to reject the null hypothesis of no autocorrelation in the standardized residuals for all stock market return series. However, the Q statistic for the standardized squared residuals suggest evidence of serial dependence in the residuals. Thus, it can be concluded, with weight given to the LM test, that all stock markets show evidence of the presence of volatility clustering effects. The existence of ARCH effects suggests that the current market volatility is a function of its own previous value.

Table 2. ARCH Test results

Country	LM(1)	LM(2)	LM(3)	Q(15)	Q <sup>2</sup> (15)
Japan	39.17*	102.92*	107.02*	22.25#	661.96*
UK	25.57*	53.97*	60.82*	36.15*	190.01*
Germany	1.15	1.96	5.52	48.65*	18.37
Italy	24.84*	35.77*	46.97*	40.40*	410.58*
France	13.78*	17.98*	32.41*	26.47*	92.06*
Canada	7.14*	22.41*	28.62*	25.06*	194.88
Switzerland	14.52*	15.98*	19.68*	37.97*	45.52*

Note: \* indicates significance at 5% level and # indicates significance at 10% level. The numbers in parentheses are lag length. LM is the Lagrange multiplier test for autoregressive conditional heteroscedasticity which follows Chi-square distribution. The test statistic is given by  $T \cdot R^2$  and the null hypothesis is that there is no ARCH effect. Q and Q<sup>2</sup> are the Ljung-Box statistic based on the standardized residuals and the squared standardized residuals respectively.

Source: Authors computation

#### 4.3. Estimation of the EGARCH Model

The EGARCH methodology is particularly suitable for analysing stock returns as it also allows for leverage effects *i.e.* asymmetric reaction of volatility on good and bad news. The interpretation of the EGARCH model is in terms of the logarithm of volatility since the model makes the leverage effect exponential rather than quadratic. This implies that no restrictions on the parameters are required to ensure non-negativity. The emphasis is, however, on the asymmetric parameter ( $\lambda$ ) which describes the impact of positive and negative shocks. For the EGARCH model, if the coefficient of the asymmetric parameter is significantly negative, then it can be concluded that negative economic shock increases volatility more than positive economic shock and vice versa.

##### 4.3.1. Discussion of results

###### (i) Table 3

The empirical results in Table 3 below for the sample period 1921 - 2017 indicate that stock market mean returns for Japan, Germany, Italy and France are positive and statistically significant, which implies that investors are compensated for high risk by high expected returns. Stock markets respond more to new information regarding political decisions that may affect domestic and foreign policy. In addition, the results are linked to investors risk aversion, which tends to be higher under Democrats, resulting in a higher equity risk premium, and thus a higher average return. The Democrat dummy is only significant and positive for Germany showing that positive election outcomes or political news have a positive impact on stock returns. On the other hand, the dummy variable is negative and insignificant for Japan, Switzerland and France and stock returns are not abnormally high as literature suggests. This could potentially imply that investors are diversifying portfolios by moving away from investing in risky assets (equities) to safer or less risky assets such as gold and government bonds. The inclusion of the US stock market returns (as captured by the S&P 500 index, also sourced from the Global Financial Database) is to examine stock market co-movement in the behaviour of stock market returns. For instance, the results indicate similar and significant return patterns for Japan and the US.

Volatility dynamics, on the other hand, reveal interesting results. The volatility persistence,  $\phi$  coefficients are significant for all stock markets and are less than one. According to Xu and Fung (2005),  $\phi < 1$  is a requirement, as it implies that fluctuations will not remain in the stock markets for a longer period. While on the other hand,  $\phi > 1$  implies that fluctuations will be persistent. This situation will lead to greater uncertainty amongst market participants. With regards to the coefficient for the size effect ( $\psi$ ) regarding volatility, the results show statistical significance for all the stock markets, while it is particularly higher for Germany indicating strong evidence of long memory volatility and that stock market volatility in Germany reacts strongly to market movements. This indicates that negative shock has a greater impact on volatility rather than the positive shocks of the same magnitude. In addition, this means that US elections are associated with statistically significant and negative shocks to the volatility of Germany.



Table 3. EGARCH Results (1921-2017)

Variables	Japan	UK	Germany	Italy	France	Canada	Switzerland
<b>Mean Equation</b>							
	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)
$a$	0.38*	-0.02	-0.05	0.26	0.44	-0.00	0.19
$b_1$	0.09*	-0.02	0.12*	0.07*	0.07*	-0.02	0.02
$\gamma_1$	-0.17	0.23	1.51*	0.34	-0.37	0.13	-0.03
$R_{US}$	0.14*	0.33*	0.63*	0.42*	0.41*	0.74*	0.43*
<b>Variance Equation</b>							
$\omega$	-0.09*	-0.15*	0.16*	-0.05*	0.01	-0.11*	-0.06#
$\psi$	0.29*	0.30*	0.66*	0.20*	0.18*	0.33*	0.21*
$\varphi$	0.96*	0.98*	0.83*	0.97*	0.95*	0.94*	0.96*
$\lambda$	-0.02	-0.04*	-0.26*	0.04*	-0.03#	0.02	-0.04*
$\gamma_2$	0.00	-0.01	0.12*	0.00	0.01	-0.02	-0.01
<b>Log-Likelihood</b>	-3,533.74	-3,148.47	-3,818.92	-3,714.57	-3,518.52	-2,907.24	-3,158.24
<b>AIC</b>	6.09	5.42	6.58	6.40	6.06	5.02	5.45
<b>Diagnostics Tests</b>							
$Q(10)$	9.88	15.82	14.62	19.28*	14.89	8.09	16.77
$Q^2(10)$	5.87	6.97	0.08	35.39*	8.95	14.32	3.21
$LM(10)$	5.71	6.76	0.08	34.04*	8.84	13.15	3.04

Note: \* indicates significance at 5% level and # indicates significance at 10% level. The numbers in parentheses are lag length. LM is the Lagrange multiplier test for autoregressive conditional heteroscedasticity which follows Chi-square distribution.

The test statistic is given by  $T * R^2$  and the null hypothesis is that there is no ARCH effect.  $Q$  and  $Q^2$  are the Ljung-Box statistic based on the standardized residuals and the squared standardized residuals respectively.

Source: Authors computation

The results of the EGARCH (1, 1) model presented in Table 3 show that there is no evidence to support of the existence of asymmetric effects in volatility for the Japan and Canada. Given that the asymmetric coefficients are not significantly different from zero, it suggests that negative shocks will not affect risk (volatility) any differently from positive shock of equal magnitude. However, the asymmetric effect coefficient ( $\lambda$ ) is negative and statistically significant for UK, Germany, France and Switzerland, suggesting negative shocks have more significant impact on the conditional variance than positive shocks of similar magnitude. This result is different with Italy, which exhibits a positive and significant asymmetric effect.

## (ii) Table A1 and Table A2

Turning to the diagnostic tests, the results show that the model is robust in characterizing the asymmetric behaviour in volatility for Japan, the UK, Germany, France Canada and Switzerland, while Italy shows evidence of conditional heteroscedasticity and serial dependence.

Modelling volatility during a period of economic uncertainty where massive shocks are generated presents an ideal environment for investigating the dynamics of volatility during periods of extreme fluctuations (1921-1945) for comparison with volatility during more tranquil periods (1946-2017). The empirical results in Table A1 in the Appendix exhibit positive and statistically significant stock market mean returns for all stock markets except the UK, indicating that the behaviour of returns in the current period is affected by the return pattern in the previous period. Also, the dummy coefficient is positive and significant for the stock returns of the UK, Italy and Germany, indicating investors are more risk averse and the direct implication would be higher compensation in the form of higher returns. The volatility dynamics show that for Canada, a Democrat being in office has significant implications for portfolio diversification and risk management, but volatility increases for Italy, France and Switzerland. There is evidence of asymmetric effects for Italy and France, with the coefficient being positive and significant. For the UK, Germany and Switzerland, negative shocks have a more significant impact on the conditional variance than positive shocks of similar magnitude. However, the results for Japan and Canada suggest no evidence of asymmetries in volatility. Table A2 in the Appendix reports the asymmetric response of the stock market returns to be significant for Italy and France, while for the other stock markets there is no presence of asymmetric effects. The Democratic dummy increases volatility of Germany, but reduces that of the UK and Switzerland, with no effect on returns.



### (iii) Result for Country-Specific Samples

The weak results of the impact of the US presidential cycle reported in Table 3 for the common sample, is found to improve drastically when we analyze longest possible samples of each country. As far as returns are concerned, negative effect is observed for the UK, but positive effect for Germany and Italy. As far as volatility is concerned, the effect is positive for the UK, Germany, Italy and France.

### (iv) Results for the US

Even though the focus is not on the US, for the sake of completeness, in Table A4 in the Appendix, we present the impact of the Democratic dummy on the returns and volatility of the S&P 500. The stock market returns are significantly higher for the full sample (1921:01-2017:12), sub-samples (1921:01-1945:12; 1946:01-2017:12) and the individual sample (1791:09-2017:12), with the presidential dummy negative and significant only for the individual sample. The results corroborate the findings by Booth and Booth (2003), Santa-Clara and Valkanov (2003) and Pástor and Veronesi (2017) who show that US stock market returns are higher during Democratic presidencies. The estimation results also indicate presence of asymmetric effects given that the EGARCH (1,1) asymmetry term  $\lambda$  is negative and highly significant for the samples under consideration except 1921:01-1945:12, implying that the variance rises more after negative stock market returns than after positive stock market returns. This indicates that negative shock has a greater impact on volatility rather than the positive shocks of the same magnitude. When considering the sample 1921:02-1945:12, volatility dynamics suggest that the increasing electoral prospects of Democratic administration trigger volatility to decrease as indicated by the negative and statistically significant presidential dummy coefficient.

### Conclusion

The political behaviour of governments may have an important effect not only on the macroeconomic performance of the whole economy, but also an important influence on the microeconomic behaviour of all individuals. There is growing interest worldwide in understanding the manner in which international stock markets are related through the extent to which volatility is transmitted among these markets. This interest has been driven by the need to investigate the potential growth effects of integration, the need to understand the implications of financial integration on investors' behaviour and for the evaluation of policies aimed at achieving financial stability. This study examined the effect of policy uncertainty attributable to presidential election outcomes of the US, and how this affect the behaviour of stock market mean returns for the G6 countries and Switzerland.

The initial step in the study was to review related theoretical and empirical literature. Theoretical literature reveals that there are two theories, which could explain the variation in stock market returns namely, the opportunistic and partisan political business cycle theories. Empirical literature is a two-fold with conflicting results because some research find that Democrat presidencies lead to higher excess return while others argue that this is not case but however, point out that political events are important in explaining some of the variation in stock market returns.

Furthermore, the results from the EGARCH (1.1) estimation indicate that conditional volatility reacts to bad news asymmetrically for some stock markets than others. For instance, for the period 1921-2017 and 1946-2017, Germany exhibits a higher negative asymmetric reaction than other stock market, while for the period 1921-1945, the UK indicates higher asymmetric volatility. Overall, the results indicate that the type of presidential administration does play a role in the behaviour of stock returns and volatility, but the sign of the impact and its statistical significance varies based on sample of data under consideration. In general, the results tend to suggest an increase in returns and volatility of other stock markets, due to the fact that democratic rules are associated with risk-averse agents, and hence investors need to be compensated via higher returns to hold equities. The risk taking behaviour in turn, leads to higher volatility as well. In other words, US risk-aversion translates into a metric for global risk aversion amongst investors. With that said, there is a need for market participants to start analysing the trajectory of a certain election, beginning at the proposed event window, in order to be able to manage their risks and be at a stable position during these periods of uncertainties.

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Appendix A

Figure A1. Monthly Stock Returns

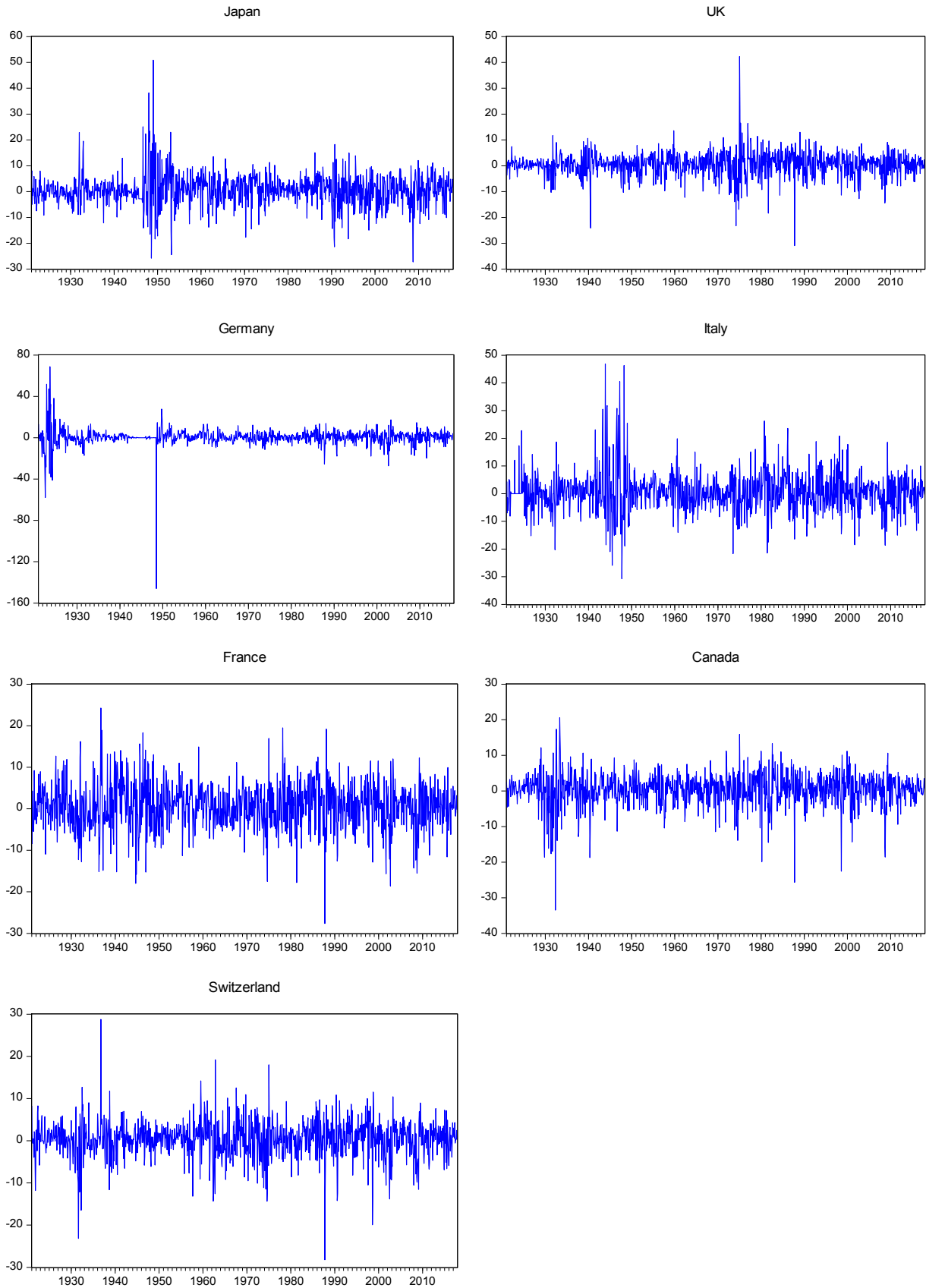


Table A1: EGARCH Results (1921-1945)

Variables	Japan	UK	Germany	Italy	France	Canada	Switzerland
<b>Mean Equation</b>							
	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)
$a$	-0.29	-0.25*	-1.37*	0.12	0.35	0.02	0.03
$b_1$	0.25*	0.02	0.13*	0.11*	0.10**	0.12*	0.15*
$\gamma_1$	0.23	0.55*	1.37*	1.40*	0.02	0.13	0.42
$R_{US}$	0.09*	0.25*	1.14	0.31*	0.22*	0.67*	0.23*
<b>Variance Equation</b>							
$\omega$	0.48	0.09*	-0.58*	0.02	3.74*	-0.12*	0.15
$\psi$	0.45*	-0.08	0.60*	-0.03**	0.22	0.22*	0.18*
$\phi$	0.68*	0.99*	1.03*	1.00*	-0.25	0.98*	0.87*
$\lambda$	0.06	-0.22*	-0.09*	0.11*	0.17**	0.04	-0.25*
$\gamma_2$	-0.07	-0.04	0.04	0.03*	0.82*	-0.03**	0.09**
<b>Log-Likelihood</b>	-793.14	-675.14	-739.14	-948.48	-943.08	-726.92	-797.57
<b>AIC</b>	5.37	4.58	5.00	6.40	6.37	4.92	4.23
<b>Diagnostics Tests</b>							
$Q(10)$	10.76	13.81	11.08	17.95**	16.94**	8.03	7.13
$Q^2(10)$	18.53*	8.12	5.33	10.13	13.07	12.41	0.87
$LM(10)$	16.18**	8.84	4.00	9.85	11.96	11.63	0.87

Note: \* indicates significance at 5% level and \*\* indicates significance at 10% level. The numbers in parentheses are lag length. LM is the Lagrange multiplier test for autoregressive conditional heteroscedasticity which follows Chi-square distribution.

The test statistic is given by  $T * R^2$  and the null hypothesis is that there is no ARCH effect.  $Q$  and  $Q^2$  are the Ljung-Box statistic based on the standardized residuals and the squared standardized residuals respectively.

Table A2: EGARCH Results (1946-2017)

Variables	Japan	UK	Germany	Italy	France	Canada	Switzerland
<b>Mean Equation</b>							
	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)
$a$	0.58*	0.20	-0.12	0.08	0.35#	-0.01	0.17
$b_1$	0.01	-0.12*	0.09*	0.05	0.05	-0.10*	-0.00
$\gamma_1$	-0.23	-0.15	0.71	0.00	-0.39	0.12	-0.15
$R_{US}$	0.43*	0.64*	0.87*	0.64*	0.64*	0.80*	0.55*
<b>Variance Equation</b>							
$\omega$	-0.06*	-0.06	0.51*	-0.09*	0.04	-0.07	-0.09*
$\psi$	0.21*	0.34*	0.50*	0.25*	0.17*	0.38*	0.20*
$\phi$	0.97*	0.93*	0.72*	0.97*	0.94*	0.90*	0.98*
$\lambda$	0.00	-0.02	-0.32	0.03#	-0.04*	-0.02	0.00
$\gamma_2$	0.00	-0.05*	0.33*	0.01	-0.00	-0.00	-0.02*
<b>Log-Likelihood</b>	-2706.39	-2410.66	-2748.74	-2718.26	-2545.93	-2163.09	-2326.64
<b>AIC</b>	6.29	4.60	6.38	6.31	5.91	5.03	5.40
<b>Diagnostics Tests</b>							
$Q(10)$	7.37	9.15	10.34	21.46*	8.37	7.58	16.91#
$Q^2(10)$	7.42	21.51*	0.15	8.47	8.40	4.33	6.14
$LM(10)$	11.59	22.33*	0.15	7.95	6.83	4.15	6.11

Note: \* indicates significance at 5% level and # indicates significance at 10% level. The numbers in parentheses are lag length. LM is the Lagrange multiplier test for autoregressive conditional heteroscedasticity which follows Chi-square distribution.

The test statistic is given by  $T * R^2$  and the null hypothesis is that there is no ARCH effect.  $Q$  and  $Q^2$  are the Ljung-Box statistic based on the standardized residuals and the squared standardized residuals respectively.

Table A3. EGARCH Results: Individual Samples

Variables	Japan (1914:08- 2017:12)	UK (1789:01- 2017:12)	Germany (1870:01- 2017:12)	Italy (1905:10- 2017:12)	France (1898:01- 2017:12)	Canada (1918:01- 2017:12)	Switzerland (1916:02- 2017:12)
<b>Mean Equation</b>							
	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)	AR (1)
$a$	0.40*	0.07	-0.08	-0.02	0.18	-0.00	0.19
$b_1$	0.10*	0.10*	0.14*	0.10*	0.08*	-0.12	0.03
$\gamma_1$	-0.20	-0.13#	2.35*	0.78*	0.14	0.15	-0.07
$R_{US}$	0.15*	0.17*	0.36*	0.37*	0.31*	0.72*	0.41*
<b>Variance Equation</b>							
$\omega$	-0.08*	-0.16*	-0.09*	-0.03*	-0.03*	-0.10*	-0.03
$\psi$	0.34*	0.27*	0.54*	0.18*	0.15*	0.35*	0.21*
$\phi$	0.94*	0.98*	0.89*	0.97*	0.97*	0.93*	0.95*
$\lambda$	-0.01	0.03*	-0.11*	0.03*	-0.02#	-0.00	-0.06*
$\gamma_2$	0.01	0.02*	0.23*	0.03*	0.02*	-0.02	0.01
<b>Log-Likelihood</b>	-3791.56	-6522.21	-5465.72	-4233.65	-4195.56	-3085.01	-3327.74
<b>AIC</b>	6.13	4.81	6.17	6.27	5.84	5.01	5.40
<b>Diagnostic Tests</b>							
Q(10)	9.78	29.43*	49.77*	23.06*	12.88	7.58	22.32*
Q <sup>2</sup> (10)	9.31	6.73	0.08	24.12*	9.90	13.06	7.62
LM(10)	8.76	6.74	0.08	23.28*	10.51	11.58	7.27

Note: \* indicates significance at 5% level and # indicates significance at 10% level. The numbers in parentheses are lag length. LM is the Lagrange multiplier test for autoregressive conditional heteroscedasticity which follows Chi-square distribution. The test statistic is given by  $T * R^2$  and the null hypothesis is that there is no ARCH effect. Q and Q<sup>2</sup> are the Ljung-Box statistic based on the standardized residuals and the squared standardized residuals respectively.

Table A4. US EGARCH results for various sample periods

Variables	1921:01:1945:12	1946:01:2017:12	1921:01:2017:12	1791:09:2017:12
<b>Mean Equation</b>				
	AR (1)	AR (1)	AR (1)	AR (1)
$a$	0.32	0.44*	0.39*	0.28*
$b_1$	0.36*	0.22*	0.25*	0.21*
$\gamma_1$	0.35	0.07	0.11	-0.21*
<b>Variance Equation</b>				
$\omega$	-0.09*	0.29*	-0.06*	-0.12*
$\psi$	0.22*	0.19*	0.24*	0.25*
$\phi$	0.98*	0.81*	0.95*	0.96*
$\lambda$	-0.06	-0.22*	-0.09*	-0.04*
$\gamma_2$	-0.04*	-0.03	0.01	-0.00
<b>Log-Likelihood</b>	-896.58	-2222.49	-3146.93	-6935.68
<b>AIC</b>	6.05	5.17	5.43	5.11
<b>Diagnostic Tests</b>				
Q(10)	12.66	13.77	7.25	21.70*
Q <sup>2</sup> (10)	7.97	9.25	12.54	7.99
LM(10)	8.14	8.28	7.23	8.09

Note: \* indicates significance at 5% level. The numbers in parentheses are lag length. LM is the Lagrange multiplier test for autoregressive conditional heteroscedasticity which follows Chi-square distribution. The test statistic is given by  $T * R^2$  and the null hypothesis is that there is no ARCH effect. Q and Q<sup>2</sup> are the Ljung-Box statistic based on the standardized residuals and the squared standardized residuals respectively.

## Non-Profit Sector as a Subject of Social Services

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### Abstract:

The article presents an analysis and assessment of the non-profit sector of Kazakhstan as a subject providing social services to households at the expense of public sector resources and on the terms of pricing in a free market. The non-profit sector of the economy, with its ability to meet the individual needs of the population at lower costs, has become in some countries the main entity providing state social services. Based on the indicators of the system of national accounts, the authors investigate the dynamics of expenditures of the non-profit sector in the structure of actual final consumption of households. The work reveals a high level of instability in indicators of gross value added and net profit for the period from 2009 to 2013 based on the scope of variation and the stability of these indicators for the period from 2014 to 2017. The authors give a description of the characteristics of different types of social services in the composition of the NPISHs sector on the basis of dynamics and structure indicators. The article presents a comparative analysis of the private and non-profit sector from the standpoint of the ratio of output, as well as the share of net profit and labor costs.

**Keywords** non-profit organizations; national accounts system; social services; output structure; gross value added; net profit

**JEL Classification:** M21; M38

### Introduction

The non-profit sector is a public association independent of state and commercial structures of various forms: foundations, non-profit partnerships, associations and unions, *etc.* They are created by citizens for the implementation of public initiatives and are aimed at economic and social transformation of society. The main activity of NPOs is to provide society with a set of benefits with special advantages, which, among other things, include services to assist the needy, *etc.*

These functions are largely related to the functions of the state, however, the fact that NPO activities remain in demand is due to the fact that the public sector cannot cover the needs of all sectors of society. Within the public sector, the allocation of resources between different areas of activity reflects the preferences of only part of the population of the state.

Along with this, certain groups of the population are ready to finance socially useful or charitable activities, subject to a somewhat different distribution of funds. In this case, non-profit organizations complement the activities of the state, and the state does not replace NPOs. Here are formed the benefits that are necessary to society, but may not bring substantial income. In the non-profit sector, innovations in social, informational and technological fields are being developed and implemented. Later they get into the work of the commercial sector. The interaction between the two sectors is mutually beneficial. For the commercial sector, consumer loyalty is increasing, stability of the organization's position is increasing. The non-profit sector receives funds for the development and fulfilment of its public mission.

### 1. Literature Review

A feature of the non-profit sector is that, in accordance with the law, an autonomous non-profit organization has the right to conduct business activities if the results of these activities are used to achieve the statutory goals of the organization. Statutory goals can be formulated in such a way that commercial activity becomes the main focus of a non-profit organization. Scientific research, education, information exchange can be included as non-commercial

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goals. This may include design research, computer services, education, management services or consulting. Thus, in the form of a non-profit organization, many types of business can be registered (Bahankova 2016).

The sector of non-profit organizations is the subject that the social state attracted to the realization of its main function: the production of social benefits in the public sector of the economy. The right to produce social benefits that have an individual character of attributing a social effect and at the same time a significant secondary effect at the macro level was granted to the non-profit sector in order to optimize the state budget expenditures (Rubinstein 2017).

Consider the functions of non-profit organizations. In accordance with the peculiarity of the organization of management in NGOs, Kleiner G. proposes to divide the functions into two main groups - specific and common, with the separation of specific into three functions - socially-supporting, social-realizing, resource-providing. Thus, as well as commercial organizations, non-profit organizations are forced to bear full responsibility for managing the enterprise (Kleiner 2015).

The authors of other works on the management of entrepreneurship, the relationship of the state, society and the economy, you can find the opinion that, depending on the type of activity, level of cooperation and general style of behaviour, the following types of NGOs engaged in non-profit entrepreneurship are distinguishable (Kazantsev and Krupanin 2013):

- Commutants - non-profit organizations engaged in entrepreneurial activity and constituting structural subdivisions of interregional NPOs;
- Patients - non-profit organizations engaged in entrepreneurial activities at the intraregional level, focused on the local population and the local market (for example, the activity of interest clubs);
- Explerents are non-profit organizations engaged in entrepreneurial activity in highly specialized areas.

Non-profit organizations as a type of organizational and legal form of doing business are usually described in many terms: social policy organizations, non-profit organizations, non-governmental organizations, organizations of civil cooperation, charitable organizations, charitable foundations, voluntary societies, mass movements, third sector organizations, independent organizations social sector organizations.

The institutional and organizational diversity of NPOs determines the uniqueness of each subject of non-commercial entrepreneurship namely, on the one hand, targets, on the other - the internal and external environment. Being based on such conclusions it is necessary to remember that any activity, including those bearing the features of entrepreneurial activity, must have a result - an effect. The size of this effect largely determines their entrepreneurial potential (Kazantsev and Krupanin 2013).

The growing attention of the world community in the second half of the 20th century to the issues of inclusive development of society and problems of social justice implementation not only intensified discussion processes in theory and practice, but also set the task of diversifying service providers in the context of individualizing the demand for public goods (Akerlof 2015).

The non-profit sector of the economy, with its ability to satisfy individual needs of the population at lower costs than the state, has become in some countries the main entity providing state social services.

Researchers note that, for example, in the US, in addition to hundreds of community organizations, it includes 90% of day care centers, 46% of primary and secondary schools, 50% of colleges and universities, 2/3 of social care centers, over 60% of clinics and hospital complexes and other organizations of the "non-market services sector" (Schlichter 2016).

The need to improve the efficiency of the non-profit sector stems primarily from the underdevelopment of its funding sources, as well as from the heightened need of the economy for the economic benefits of the social sphere.

Currently, methodological issues of performance evaluation and analysis are developed mainly in relation to the business sector and practically do not affect the activities of the non-profit sector. At the same time, the importance of the functioning of the non-profit sector requires an in-depth methodological study of the works of domestic and foreign scientists. The study of the issue of the non-profit sector becomes even more justified when you consider that this sector performs such important functions as preserving and augmenting the most important elements of the national economy (educational, scientific, cultural potentials), social protection of certain social groups, and the realization of professional and amateur interests.

The Law of the Republic of Kazakhstan "On Non-Commercial Organizations" and other regulatory and legal acts in force regulates non-profit organizations in the Republic of Kazakhstan (Law 2001).

Salamon and Anheier (2014), presenting a description of the traditional concept of the welfare state, emphasize that there is a tacit assumption in economic approaches that the greater the participation of the public sector in meeting collective needs, the more marginal is the role of public organizations.

According to Henry Hansmann, public organizations are more reliable service providers than private sector organizations (due to the prohibition of the distribution of income from the activities carried out among members of the organization or its founders and employees). Therefore, non-governmental organizations are more responsive to the needs of the environment, because as commercial motives are not their basic principle (Hansmann 2016).

Di Maggio and Anheier (2014) point out that for some theorists, the state delegates an increasing number of functions to private organizations, as well as quasi-public organizations, in order to maintain stability and legitimacy - is an expression of a crisis of state legitimacy. In support of this thesis, the argument is put forward that if a state is not able to exercise power, then to maintain stability and legitimacy, its independence relative to individual social groups' decreases and, in general, it has problems with "governance".

Non-profit organizations can be created in any form provided by the legislation of the Republic of Kazakhstan. From the point of view of goals, notes Yuryev (2016), places and functions in modern society, non-profit organizations are not homogeneous. Some of them are created and function to provide economic benefits to "third parties" who are not members of a non-profit organization, others to meet, first of all, the needs of members of a non-profit organization (association, union, non-profit partnership), others provide social services, promote development culture, education, provide charity and carry out other socially useful goals.

Attention also deserves the position of V. Seibel, who asserts that the meaning of the existence of public organizations has conditioned by the fact that they represent "an institutional solution that allows modern societies with a complex structure to cope with political and social problems" (Wolfgang 2013).

Thus, today, new opportunities are opening up for expanding the activities of non-profit organizations that are gradually transforming into a vast and influential system in all areas of the economic, social and public life of the Republic of Kazakhstan.

## 2. Methodology

According to official data, the contribution of the nonprofit sector to the country's GDP in 2016 was 7.6% in the USA, 2.7% in New Zealand, 3.8% in Australia, *etc.* (Rozhdestvenskaya 2017). For Kazakhstan, this value in 2016 was 3.4%, which makes it possible to consider the sector of non-profit organizations on a scale quite comparable with other countries (Committee of Statistics).

The diversification of sources of financing of the non-profit sector in many countries through not only government sources, but also private and corporate funds, foreign and international organizations has provided a stable financial base for the non-profit sector. Non-profit organizations also have the opportunity to receive subsidies and subsidies from the state, including grants. Non-profit goals of management require them not only to develop their own income-generating activities, but also to attract external sources of funding from the state, the population and the private sector (Salamon and Anheier 2014). However, ultimately, it was their own commercial revenues that allowed the NPO sector to secure an independent financial base of (Harvard Center).

The modern stage of development of the non-profit sector is different in that it includes the phenomenon of social entrepreneurship, which combines a social mission with different sources of income that provide the subject with financial sustainability (grants, subsidies) and provide an opportunity to receive permanent income related to the activity in the market (Dees and Emerson 2017). Moreover, these revenues are distributed partially or not at all, but are directed to a social mission or development of an organization as an economic entity (Thompson and Doherty 2012).

Social entrepreneurship has considered by many researchers to be the fourth sector of the economy, which combines the characteristics of all three sectors (public, private and non-commercial) in its activity (Santos 2012). The official statistics of Kazakhstan does not single out social entrepreneurs and does not fix their number and volumes of economic activity due to the lack of basic definitions in the 2008 SNA, which is the basis of modern statistical measurements.

In this regard, the only representative data are indicators of the development of the non-profit organizations sector, which is actually the basis and launching pad for the vast majority of social entrepreneurs.

The aim of the study is to analyze the scale and structure of the non-profit sector of Kazakhstan at the macro level to quantify its role in the economy and a comparative assessment of its performance with the commercial sector for the main types of social services.

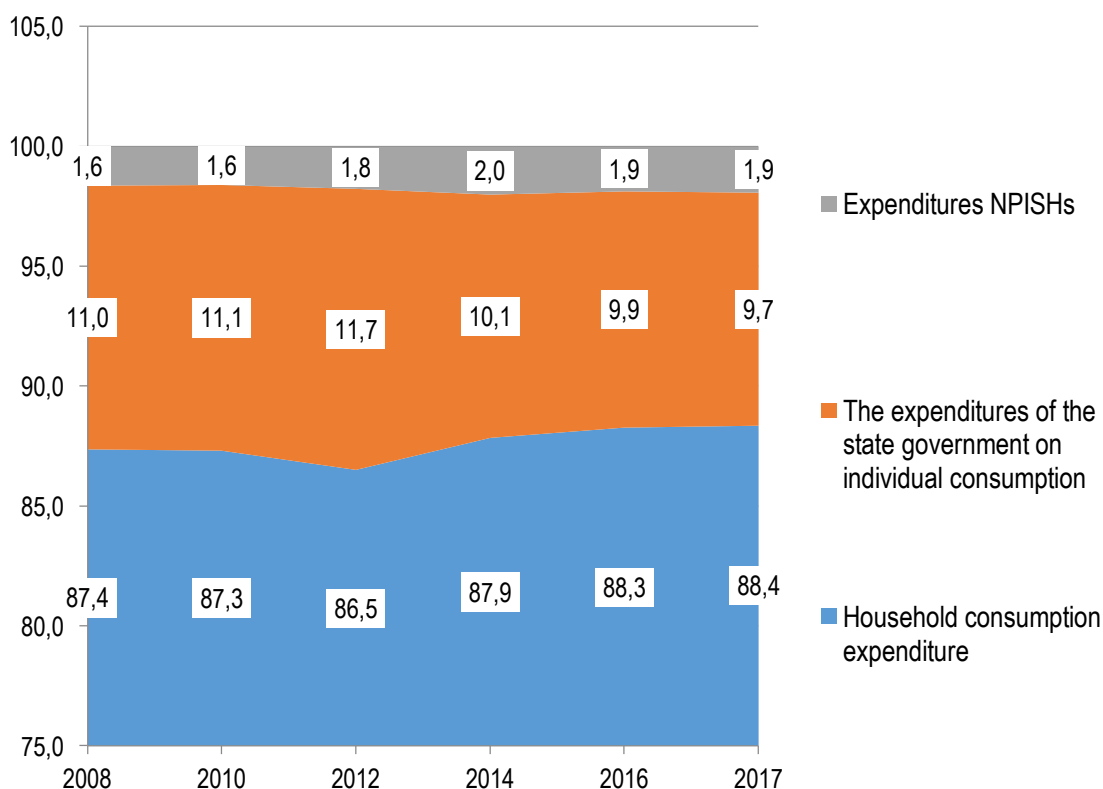
Omarova (2017) underline in his research that: "The higher level of education gives the higher initial salary of the employee. In addition, employees with higher education acquire also basic skills, as a result of which their human capital accumulates more rapidly, which are reflected in the greater steepness of the curve 'log of salary - experience' than among workers with secondary education" (Omarova 2017).

The research methods are economic-statistical methods for analyzing the dynamics and structure, comparative analysis and groupings. The analysis involves all the main indicators of the development of the sectors of the economy and final consumption of the population of Kazakhstan, which characterize the activities of the non-profit organizations serving households.

For ten years, noticeable changes have occurred in the structure of the actual final consumption of households in Kazakhstan. Despite the small amount of structural changes in the percentage, it should be noted that at the macro level, specific numerical values in the structure of household expenditures change little and, above all, the stability of the values achieved over time.

From these positions, it can be said that the trend of increasing the role of NPISHs in providing services to households is quite stable. If in 2008-2013 their share was 1.6 - 1.8%, then since 2014 the share of this sector of the economy is no less than 1.9 - 2% (Figure 1).

Figure 1. Structure of the actual final consumption of the population of Kazakhstan, 2008–2017, in %



Source: compiled by authors

The non-profit sector of Kazakhstan can and should become one of the main sources of economic growth. To this end, measures are being taken to reduce all types of business costs to the front, the processes of rendering public services will be maximally optimized and translated into electronic format. We consider it necessary, in the study, on the basis of the provision on the key role of the activities of the non-profit organizations serving households to track the dynamics of the development of the actual final consumption of the population of Kazakhstan for the period 2008-2017, shown in Figure 1 in %.

At present, many time series forecasting methods have been developed. The goal of such a forecast is to show what results can be achieved in the future if we move to it with the same speed or acceleration as in the past.

We will conduct a quantitative analysis of forecasting on the basis of formalized forecasting methods, which are based on the actually available information material on the exponential smoothing method. It lies in the fact that the procedure for finding the smoothed level uses only the previous levels of the series, taken with a certain weight, and the weight decreases as it moves away from the point in time for which the smoothed value of the series level is determined. If for the original time series  $y_1, y_2, y_3, \dots, y_n$  denote the corresponding smoothed levels by  $S_t, t = 1, 2, \dots, n$ , this exponential smoothing is carried out according to the formula:

$$S_t = (1 - \alpha) y_t + \alpha S_{t-1} \tag{1}$$

Some sources give a different formula:

$$S_t = \alpha y_t + (1 - \alpha) S_{t-1} \quad (2)$$

where:  $\alpha$  - smoothing parameter ( $0 < \alpha < 1$ ); the quantity  $(1-\alpha)$  is called the discount factor.

In practical tasks of processing economic time series, it is recommended (unreasonable) to choose the value of the smoothing parameter in the range from 0.1 to 0.3. There are no other precise recommendations for choosing the optimal value of the parameter  $\alpha$ .

In some cases, it is proposed to determine the value of  $\alpha$  based on their length of the series being smoothed:  $\alpha = 2 / (n + 1)$ .

As for the initial parameter  $S_0$ , in problems it is taken either equal to the value of the first level of the  $y_1$  series, or equal to the arithmetic average of the first few members of the series. If, at the approach to the right end of the time series, the values smoothed by this method with the selected parameter  $\alpha$  begin to differ significantly from the corresponding values of the original series, it is necessary to switch to another smoothing parameter. The advantage of this method is that when smoothing, neither the initial nor the final levels of the smoothing time series are lost.

The application of this method, by the example of forecasting the studied indicators shown in Figure 1 for the period 2008-2017, gave the following result values characterizing the obtained trend models.

Finding the equations of trend models is carried out by the method of least squares. Analysis of the accuracy of determining the estimates of the parameters of the trend equation is carried out by calculating the estimating parameters using the appropriate formulas:

Standard equation error:

$$S_y = \sqrt{S_y^2} \quad (3)$$

F-statistics. Fisher criterion.

$$F = \frac{R^2}{1 - R^2} \frac{n - m - 1}{m} \quad (4)$$

Coefficient of determination.

$$R^2 = 1 - \frac{\sum (y_i - y_t)^2}{\sum (y_i - \bar{y})^2} \quad (5)$$

By analogy of the calculations, predictive values were obtained for all analyzed factor indicators (Table 1).

Table 1. Equations of trend models of projected indicators, characterizing in quantitative terms the actual final consumption of the population of Kazakhstan for the period 2008-2017.

Estimated indicator	The equation trend models	Average quad evaluation error	Coefficient of determination, $r^2_{yx}$	Fisher coefficient F-criterion
Expenditures NPISHs	$Y_t = 1,54 + 0,074 t$	0,1042	0,695	8,89
Government spending on individual consumption	$Y_t = 11,753 - 0,334 t$	0,5506	0,617	6,45
Household consumption expenditure	$Y_t = 86,693 + 0,269 t$	0,5681	0,742	3,91

Source: compiled and calculated by authors

The models, on the basis of which the forecast was carried out, with the obtained probability levels  $R^2$ , allow us to assert that while maintaining the established patterns of development of the predicted values, they fall into the calculated value of the revealed trend of indicators (Table 2).

Table 2. The predicted values of the projected indicators for the period 2018-2020

Estimate Indicator	2018	2019	2020
Expenditures NPISHs	2,06	2,13	2,21
Government spending on individual consumption	9,41	9,08	8,74
Household consumption expenditure	88,57	88,84	89,11

Source: compiled and calculated by authors

In general, the predicted values obtained on the basis of the solution of the regression equations and the predicted values calculated on the basis of single-factor regression equations from the time trend, in most cases, coincide within the limits of the permissible error.

Based on the constructed trend models and the carried out forecast calculations, it is possible to plan the participation of the non-profit sector in the provision of social services and thereby more fully and in detail carry out the planning of the socio-economic development of the country.

### 3. Application functionality

The actual participation of the non-profit sector in the provision of social services has increased, in our opinion, for the following reasons:

- *First*, due to the redistribution of resources of the public sector in its favour and recognition of its social efficiency by the state. This is confirmed by the mirror trend of government spending on individual consumption: from 2008 to 2012, the share of the state was 11.0–11.7%, while from 2013 to 2017 this share was 10.1–9.7%. That is, simultaneously with the increased participation of the sector NPISHs there was a reduction in state participation in the actual final consumption of the population.
- *Secondly*, due to the fact that a number of subjects of the non-profit sector began to develop as social entrepreneurs and provide services to the population at prices lower than the private sector, which has activated the demand for these services. But at the same time, it should be noted that there is a trend to increase the share of own expenditures of households. So, from 2008 to 2017, at first glance, insignificant but steady changes in this share led to a structural shift of 1%: from 87.4% to 88.4%. This suggests that the availability of individual social services for households has not exactly improved, and there is more reason to say that accessibility has decreased (Table 3).

Table 3. Structural indicators of sector operations of NPISHs

Indicators		Share in issue, in %			Specific weight in GVA, %	
		GVA	Salary	Net profit	Salary	Net profit
1	2009	68,5	65,2	0,0	95,2	0,0
2	2010	73,1	62,9	4,1	86,0	5,7
3	2011	85,1	61,1	17,0	71,8	20,0
4	2012	52,5	35,8	12,4	68,2	23,7
5	2013	52,7	46,3	5,4	87,8	10,2
6	Δ between max and min for 2013/2009 (variation range)	32,6	29,3	17,0	24,3	23,7
7	2014	72,7	53,3	14,0	73,4	19,2
8	2015	75,4	56,5	14,1	75,0	18,7
9	2016	72,8	58,7	12,7	80,6	17,4
10	2017	73,0	58,9	12,7	80,7	17,3
11	Δ between max and min for 2017/2014 (variation range)	2,7	5,6	1,4	7,3	1,9
12	Line 6/ line 11	12,1	5,2	12,1	3,3	12,5
13	On average for the period 2017/2009	<b>73,5</b>	<b>56,8</b>	<b>18,2</b>	<b>79,9</b>	<b>14,7</b>

Source: compiled by authors

In 2009-2013, the indices of the share of GVA, wages and net profit in the output of the sector varied significantly, exactly as in the structure of GVA. Thus, the net profit in 2009 was completely absent; in 2012 it was 23.7% of GVA, and the following year 10%. The level of remuneration in relation to GVA varied in the range from 95.2% in 2009 to 68.2% in 2012.

The difference between the maximum and minimum values for the period 2013–2009 (the statistical indicator is the range of variation) turned out to be an order of magnitude larger than for the period 2017/2014. The interval of scatter of values for the share of GVA and net profit in the issue was 12 times larger. For remuneration, the interval was 5.2 times longer, and so on (Table 3).

In 2014-2017, all indicators stabilized. The share of GVA in output ranged from 72.7% to 75.4%, that is, the interval was only 2.7%. The share of net profit in the issue fluctuated in the range of 1.4%, in GVA - 1.9%. Structural fluctuations decreased 12 times for indicators of the share of GVA and net profit in output and GVA; 5 times for pay in release; 3.3 times to pay for GVA.

It can be said that the average values of the proportion of the main elements in the output of the NOOSH sector for the period 2009-2017 were as follows: GVA: 73.5%, remuneration: 56.8%; net profit: 18.2%. Accordingly, in the structure of GVA, the average wage for the period was 79.9%, while net profit was 14.7%. The structure of the NPISH sector by type of activity and production and income generation indicators.

A comparative analysis of the development of activities within the NPISH sector can be carried out in three of its components, distinguished in the system of national accounts:

- Education;
- Health and social special services;
- Other services (include communal, social, personal).

In terms of share in the production of services (output), sustainable leadership is held by the other services sector, since combines several types of them, the dominant of which are services of homeowners' cooperatives. From 2009 to 2017, the sector accounted for 80.7%, and for the last four years, 84.5% (Table 4).

Table 4. Structure of the NPO sector by type of activity and indicators of production and income generation, %

	Education			Health and special social services			Other services (utilities, personal, etc.)		
	Share in issue	Share in wages	Share in net profit	Share in issue	Share in wages	Share in net profit	Share in issue	Share in wages	Share in net profit
2009	3,2	2,8	0,0	11,3	7,2	0,0	85,5	90	0,0
2010	3,0	2,8	9,3	14,8	9,6	10,8	82,2	87,6	79,9
2011	2,9	3,2	3,0	21,9	14,3	25,5	75,2	82,5	71,5
2012	3,1	3,1	12,3	23,5	11,8	0,2	73,4	85,1	87,5
2013	3,1	2,7	20,2	25,1	10,5	5,4	71,8	86,8	74,4
On average for 2009-2013	3,1	2,9	9,0	19,3	10,7	8,4	77,6	86,4	82,7
2014	3,1	2,3	7,9	10,7	8,9	9,0	86,2	88,7	83,2
2015	3,1	2,8	6,0	11,3	8,9	17,1	85,6	88,3	77,0
2016	3,0	3,2	2,9	13,5	8,9	50,9	83,5	87,8	46,2
2017	3,0	3,2	2,6	14,4	9,0	47,4	82,6	87,8	50,0
On average for 2014-2017	3,0	2,9	4,8	12,5	8,9	31,1	84,5	88,2	64,1
2009	3,2	2,8	0,0	11,3	7,2	0,0	85,5	90	0,0
2010	3,0	2,8	9,3	14,8	9,6	10,8	82,2	87,6	79,9

Source: compiled by authors

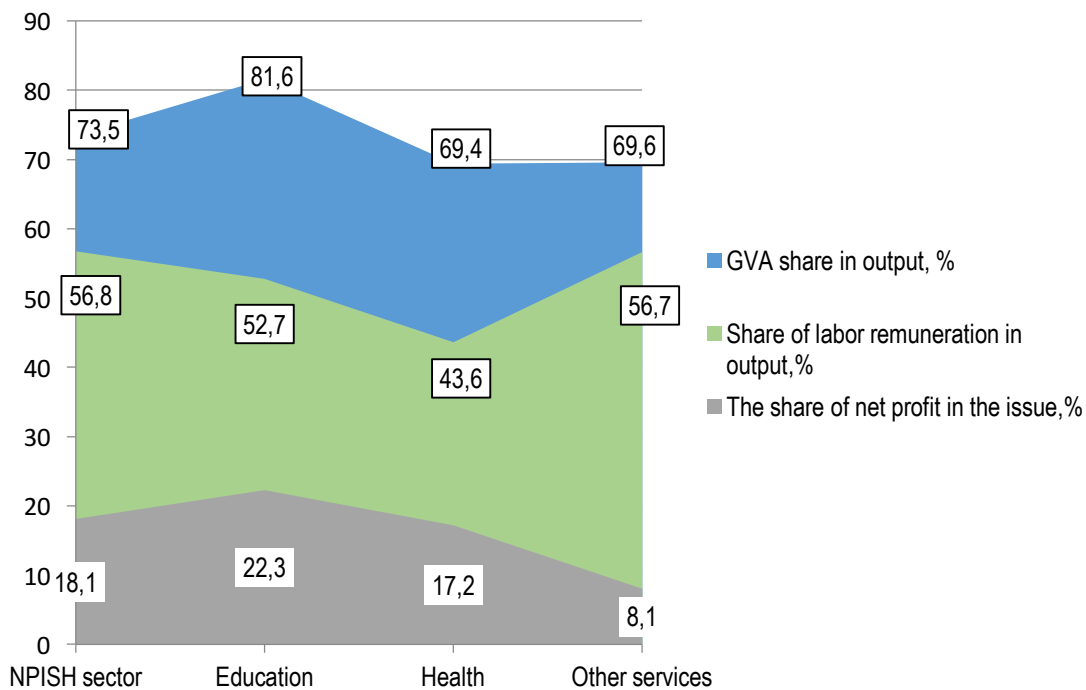
The share of services for the period from 2009 to 2017 practically did not change and amounted to an average of 3%. The share of health care and special social services decreased from 19.3% from 2009 to 2013 to 12.5% on average for 2014 - 2017. This activity was the least stable. At the same time, the share of the three types of payroll activities was less susceptible to these changes: in education, the share remained at the level of 2.9%, in healthcare decreased by 1.8%, and in "other services" increased by 1.8%.

Changes in production volumes were less reflected in the share in total wages than in profits. The share of education in the profit of the NPO sector decreased by 4.2% on average over the period 2014 - 2017 compared with the period 2009 - 2013. The share of healthcare in the sector's profit increased from 8.4% in 2009 – 2013 to 31.1% on average for the period from 2014 to 2017. At the same time, the share of "other services" in profits decreased from 82.7% to 64.1%.

This can be considered a positive change, since in the first five years "health care" produced an average of 19.3% of the output, but it had 5.4% of the net profit. While "education" produced 3.1% of output and received 9% of revenues, while "other services" produced 77.6% of the volume, and received 82.7% of net profit of the sector. If we look at the structure of output within each type of service and compare it with the structure of output in the sector as a whole, then education has the highest share of gross value added (81.6%) and net profit (22.3%) (Figure 2).



Figure 2. Structural shares of the main elements of the output by type of activity in the composition of the NPISHs sector on average for 2009 - 2017, in %



Source: compiled by authors

Lower proportions of gross value added in health care and other services are associated with the characteristics of economic activities that require more intermediate consumption (raw materials and materials) in the composition of output.

Inside gross value added, again the main elements of which are labour remuneration and net income, the consumption of fixed capital in the field of education is relatively less than in other activities, which ensures its higher profitability. However, labour remuneration in other services has the largest share of 56.7%, while the share of net profit in this segment is the smallest 8.1%. Health care has about the same share of gross value added in output with other services, while the share of wages in this form is the smallest - 43.6%, while profits are 17.2%.

For analysis, we selected education, health care and other services, which differ significantly in composition from the similar group of the non-profit sector, since in the non-profit sector, it includes homeowners' cooperatives, which create the bulk of economic entities.

In terms of output for the period from 2009 to 2017, the sector of non-financial corporations or the private sector (hereinafter referred to as the NFC sector) exceeds the non-profit sector by 3.9 times, by gross value added by 4 times, by the wage fund by 3.3 times, by net volume arrived 6.6 times. That is, the scale of the private sector makes it possible to speak about its relatively great opportunities in the provision of social services. At the same time, according to the structure of the main indicators, the main differences of the sectors can be estimated as follows (Table 5).

Table 5. Comparison of the main elements of the output sectors of NFC and NPISHs

	GVA share in output, %	Share of labor remuneration in output, %	The share of net profit in the issue, %
Other services (NFC)	71,0	32,0	35,4
Education (NPISHs)	81,6	52,7	22,3
NFC sector	<b>70,7</b>	<b>46,6</b>	<b>19,1</b>
Education (NFC)	78,1	55,7	18,1
Sector	<b>73,5</b>	<b>56,8</b>	<b>18,1</b>
Health and special social services (NPISHs)	69,4	43,6	17,2
Health and special social services (NFC)	65,8	45,0	13,7
Other services (NPISHs)	69,6	56,7	8,1

Source: compiled by authors

The share of net profit in the output of the private sector is generally higher than that of the non-profit, but the difference was only 1%. The share of labour costs in output in the non-profit sector is higher by 10%. That is, with almost the same share of profits in these two sectors, in the non-profit sector, much larger funds had spent on the payment of wages.

Almost the same structure occurs in private and non-commercial health services. Due to high intermediate costs in health care, a lower share of GVA in output, a lower share of remuneration and a lower share of profits. The higher position of the non-profit sector in the table has explained by the fact that in this sector there is a greater share of special social services that had characterized by lower intermediate consumption.

As for the "other services" in the private and non-commercial sector, they are at different poles of the scale. This is due to the inclusion in the non-profit sector of all housing cooperatives of homeowners and the predominance in the private sector of individual and social services, which are the least material-intensive. Low wages in this segment causes a high share of profits. In fact, for these two positions the comparison is inexpedient.

## **Conclusion**

Excessive regulations allow a stationary system to reproduce itself unopposed, and the absence of the principle of joint and several liability of the state, the family and the individual stimulates the replenishment of the customer base in all expanding scales.

Nevertheless, there are examples of effective practice of small capacity homes for the elderly in Kazakhstan, which operate in rural areas based on self-sufficiency, as ordinary households with a minimum staff of social workers. Calculations based on their actual costs indicate monthly instalments of 185 US dollars per month, which is 2.7 times less than the full cost of the service in the public hospital. In addition, the recipients of services in these households rate the quality of these services as quite satisfactory (Jazykbayeva 2015).

Based on the materials of the study, it is advisable to draw the following conclusions.

At the present stage of development, non-profit organizations occupy a significant niche in the comprehensive development of the state as the center of economic and social relations.

The sector of non-profit organizations is one of the entities providing social services. At the same time, for the period from 2009 to 2017, its output in education services is 40.4 times less, and for health services and special social services it is 16.2 times less than in the private sector. Compared to the public sector, volumes are 110.8 and 25.5 times smaller.

Nevertheless, the sector of non-profit organizations occupies its own special niche, as it has the advantage of the private sector (individualization of services), but provides this service at a lower price (or free of charge) at a more convenient time and place for the client than the private sector. The actual participation of the NCC has increased partly due to the redistribution of public sector resources in favor of non-profit organizations, partly because some of the non-profit sector entities began to operate in a social entrepreneurship mode and earn at lower prices in the least capital-intensive activities. Structural indicators of the operations of the NPO sector during this period stabilized: the range of variation in GVA, wages and net profit in the sector output was 12,5 and 12 times smaller.

Within the NPO sector, the "other services" segment dominates due to the inclusion of all homeowners' cooperatives in it, which gives it 84.5% of GVA; 88.2% remuneration; 64.1% of the sector's net profit. Among the positive sectoral trends, we can note the redistribution of net profit in favor of health services and special social services compared with the period 2009-2013, when there was a disproportion between the participation in the issue (GVA) of the industry and net profit of education services.

If we look at the structure of output by type of activity and compare it with the sectoral one, then education has the highest share of value added and net profit in the issue. At the same time, the lowest share of net profit and the highest share of wages characterize the other services segment. Features of health care and housing and communal services are that in these activities a relatively higher proportion of intermediate consumption and consumption of fixed capital than in education.

A comparison of the sectors of NPISHs and non-financial corporations suggests that the share of net profit in the private sector is higher than that of the non-profit by only 1%, while the share of labor costs in the non-profit sector is higher by 10%.

At the same time, education and health care services (including social special services) in the NOOSH sector have even a larger share of net profit (but a smaller share of labor remuneration) than similar private sectors, since choose and provide services with minimal capital intensity. However, since the net profit in non-profit organizations is not distributed, but goes to the development of activities, the position of this sector can be considered sustainable.

Thus, the development of the non-profit sector occurs under the influence of the national characteristics of the Republic of Kazakhstan. Also for the non-profit sector has characterized by trends of rapid growth and increasing influence on the development of the national economy.

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