The Nexus Between Domestic Investment and Economic Growth in G7 Countries. Does Internet Matter?

Sayef BAKARI
LIEI, Faculty of Economic Sciences and Management of Tunis
University of Tunis El Manar, Tunis
bakari.sayef@yahoo.fr

Article's history:

Received 12th of April, 2021; *Received in revised form* 30th of May, 2021; *Accepted* 9th of July, 2021;
Published 30th of July, 2021. All rights reserved to the Publishing House.

Suggested citation:

Bakari, S. 2021. The Nexus between Domestic Investment and Economic Growth in G7 Countries. Does Internet Matter? *Journal of Applied Economic Sciences*, Volume XVI, Summer, 2(72): 239– 240.

Abstract*:*

We examine the effect of the Internet on the relationship between domestic investment and economic growth. Data for G7 countries over the period 1991–2018 are used for panel data analysis. Empirical analysis prove that domestic investment affect positively on economic growth, however the Internet doesn't have any effect on economic growth. Also, the effect of domestic investment on economic growth proves to be not affected by the Internet.

Keywords: domestic investment; economic growth; Internet; G7 countries; panel data analysis.

JEL Classification:O31; O32; O38; O47; O5.

Introduction

The relationship between the Internet and various macroeconomic variables is well researched, including economic growth (Noh and Yoo 2008, Choi and Yi 2009, Bakari and Tiba 2020), inflation (Yi and Choi 2005), service trade (Freund and Weinhold 2004, Choi 2010), research and development (R&D) expenditure (Choi and Yi 2017), foreign direct investment (Choi 2003), innovation (Bakari 2019, Bakari *et al* 2020a). The relationship between domestic investment and economic growth has been explored extensively. The empirical results for the effect of domestic investment on the economic growth are rather mixed. Some are positive (Bakari and Tiba 2019, Mohammed *et al* 2019, Akalpler and Hove 2019, Sulub *et al* 2020), others are negative (Bakari 2020, Bakari 2018, Bakari 2017, Umar-Gingo and Demireli 2018) and other are not significant (Appiah 2018, Olanrele 2019, Bakari *et al* 2020b, Bakari *et al* 2018, Bakari 2017)

However, how the Internet influences the relationship between domestic investment and economic growth is unexplored. Domestic investment is related to stimulate economic growth and development by its effect on several economic variables (decrease of unemployment, increase of exports ...). According to Bakari (2020), domestic investment is considered one of the most influential elements because of its ability to improve social well-being and strengthen a nation's prosperity.

The Internet is related to the dissemination of knowledge and to the narrowing the geographical distances between/in countries in inducing domestic investment. According to Choi (2003), the Internet is one of main driving forces in expediting the integration of the world economy and thus enhancing the welfare of the human beings.

The Internet spillover effect on economic growth can be explained by Romer's (1990) and Coe and Helpman's (1995) endogenous growth model. In this article, we explore whether the interaction terms for domestic investment and the Internet contribute to economic growth.

This article tests the hypothesis that the effect of domestic investment on economic growth is positively influenced by Internet use. Equivalently, we test the hypothesis that the Internet's effect on economic growth will be positively strengthened by an increase in domestic investment. We perform cross-country panel data analysis using World Development Indicator (WDI) data. In Section II, we set up a growth equation. Section III includes the data and the empirical results. Section IV concludes the article.

1. Model and Data

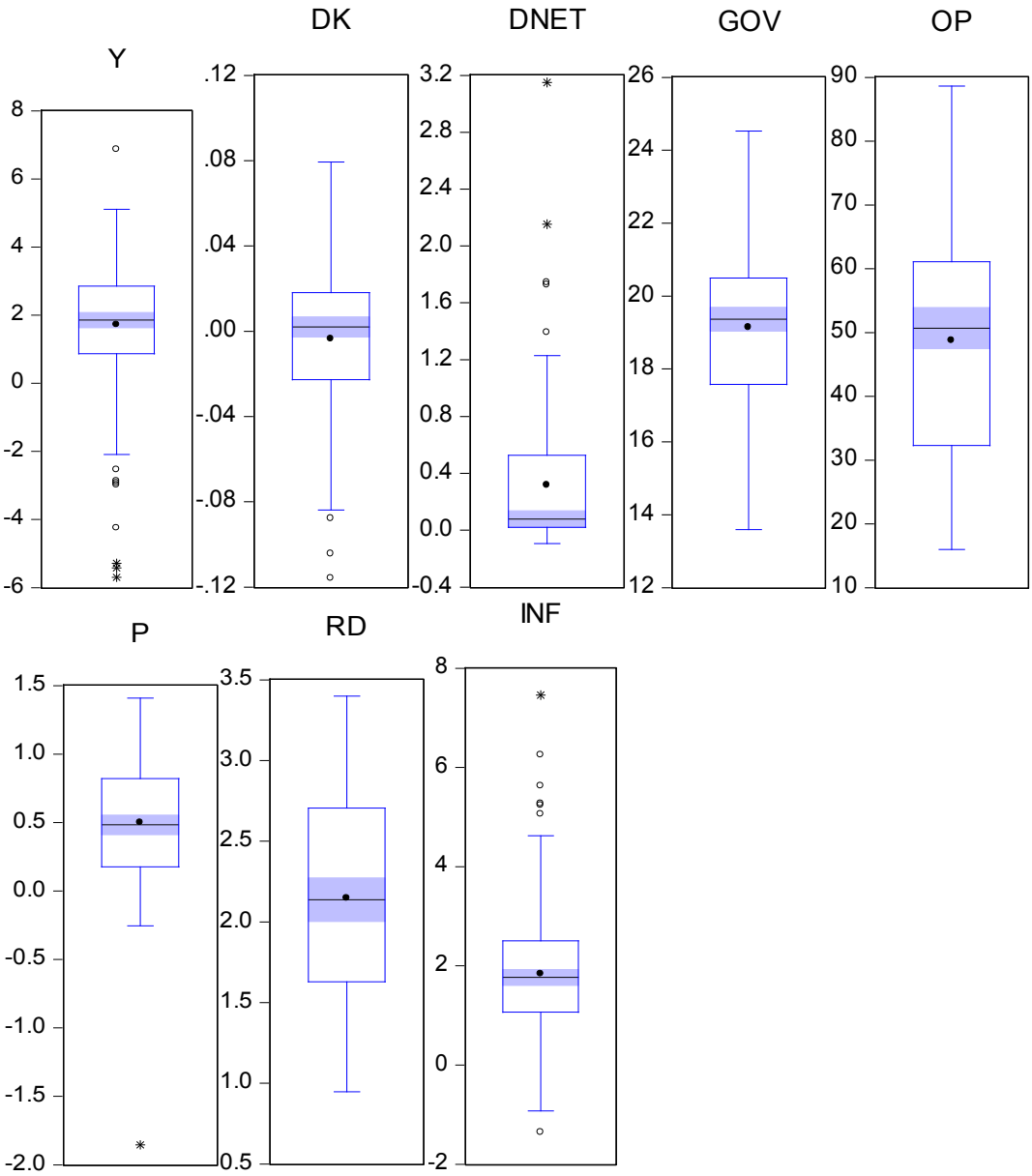
We set up a GDP-growth equation as in Romer (1990) and Barro (1997):

$$Y_{it} = \beta_0 + \beta_1 DK_{it-1} + \beta_2 DNET_{it-1} + \beta_3 DK_{it-1} * DNET_{it-1} + \beta_4 GOV_{it} + \beta_5 INF_{it} + \beta_6 OP_{it} + \beta_7 P_{it} + B_8 RD_{it} + w_i + u_t + v_{it} \quad (1)$$

where: w_i is a country effect, u_t is a year effect, and v_{it} is independent and identically distributed error; DX stands for the growth rate of variable X. Y_{it} stands for the GDP growth rate of contry*i*in year *t*; K_{it} stands for gross fixed capital formation as a percentage of GDP (Domestic investment).NET_{it} stands for the number of Internet users per hundred people; GOV_{it} represents the government expenditure as a percentage of GDP;RD_{it} stands researchers in R&D/million people. OP_{it} stands trade/GDP (%);INF_{it} stands inflation, consumer prices (annual %);P_{it} represents annual population growth. The 1-year lagged variables such as DK_{it-1}, $DNET_{it-1}$, and DK_{it-1}, $DNET_{it-1}$ are used to consider lagged effect and to avoid an endogeneity problem.

Data for G7 countries over the period 1991–2018 are used for panel data analysis. All the variables used are from the WDI, World Bank. Summary statistics for the data are registered in Table 1. The scenic photography of descriptive statistics has been shown by making a boxplot in Figure 1. It shows that mean values are around the median values, which shows that the distribution is approximately normal. There are no extreme or far outliers in the sample. Therefore, our data is appropriate to proceed for panel analysis.

Figure 1. Boxplot of variables



Source: Authors' calculations using Eviews 10 software

2. Empirical Results

Table 2 lists the regression results. We estimated the growth equation (equation 1) by various estimation methods: pooled ordinary least squares (OLS), individual fixed effects, individual random effects, generalized method of moments (GMM) estimation, GMM (Fixed Effect), GMM (Random Effect), two-stage Least Squares (2SLS) estimation, 2SLS (Fixed Effect) and 2SLS (Random Effect).

The aim of the Hausman test is to define and choose our most suitable model, whether fixed or random. If the probability of the Hausman test is minimum 5%, in this case the fixed-effects model is significant and will be kept. However, if the probability of the Hausman test is greater than 5%, then the random effect model is significant and will be possessed. In our case, we have the probability that the Hausman test is less than 5% for a value equal to 0.00%. This indicates that the fixed effects model is significant and will be retained. According to the findings of our estimation and based on the output of the Hausman test in Table 2, Pooled OLS Fixed Effect, GLM Fixed Effect and 2SLS Fixed Effect will be chosen to interpret our results. These latter indicate that domestic investment (DK) has positive effect on economic growth (Y) however the use of Internet (DNET) has not any effect on economic growth (Y).

The estimated coefficients of the interaction terms of the use of Internet and domestic investment (INTER) proved to be positive and not significant through Pooled OLS Fixed Effect, GLM Fixed Effect and 2SLS Fixed Effect. This means that the effect of the use of Internet on economic growth does not affect by the domestic investment and the effect of the domestic investment on economic growth does not affect by the use of Internet.

Conclusion

We hypothesized that the domestic investment strengthens the positive or the negative effect of the use of Internet on economic growth in G7 countries. Empirical results indicate that domestic investment has a positive effect on economic growth but the use of the Internet does not have any effect on economic growth.

Also the interaction terms of the use of Internet and domestic investment proved to be positive and not significant, which mean that the effect of the use of Internet on economic growth does not affect by the domestic investment and the effect of the domestic investment on economic growth does not affect by the use of Internet. Undoubtedly, the Internet offers positive externalities which enhance economic growth. Moreover, by minimizing transaction costs, time and facilitating communication, productivity improves well, then the way to growth. In this perspective, these economies are invited to direct the use of the Internet towards productive means to reap the benefits of the diffusion of the Internet, in terms of dissemination and creation of spillover, know-how, expertise and information dissemination that leads to facilitate the adoption of innovative technologies in production processes and proactively improve the prosperity of this region as a whole.

Disclosure statement

No potential conflict of interest was reported by the author.

References

[1] Akalpler, E., and Hove, S. 2019. Carbon emissions, energy use, real GDP per capita and trade matrix in the Indian economy-an ARDL approach. *Energy*, 168: 1081–1093. DOI:10.1016/j.energy.2018.12.012

[2] Appiah, M.O. 2018. Investigating the multivariate Granger causality between energy consumption, economic growth and CO2 emissions in Ghana. *Energy Policy*, 112: 198– 208.

[3] Bakari, S. 2017a. Appraisal of trade potency on economic growth in Sudan: New empirical and policy analysis, Asian Development Policy Review, *Asian Economic and Social Society*, 5(4): 213-225.

[4] Bakari, S. 2017b. The long run and short run impacts of exports economic growth: Evidence from Gabon, *Economic Research Guardian, Weissberg Publishing,* 7(1): 40-57.

[5] Bakari, S 2018. The impact of domestic investment on economic growth new policy analysis from Algeria, *Bulletin of Economic Theory and Analysis*, *BETA Journals,* 3(1): 35-51.

[6] Bakari, S., Mabrouki, M., and Elmakki, A. 2018. The impact of domestic investment in the industrial sector on economic growth with partial openness: Evidence from Tunisia, *Economics Bulletin*, 38(1): 111-128.

[7] Bakari, S., and Mabrouki, M. and Othmani, A. 2018. The six linkages between foreign direct investment, domestic investment, exports, imports, labor force and economic growth: new empirical and policy analysis from Nigeria, *Journal of Smart Economic Growth*, 3(1): 25-43.

[8] Bakari, S. 2019a. If France continues this strategy, taxes will destroy domestic investment and economic growth, *Journal of Smart Economic Growth*, 4(1): 31-45.

[9] Bakari, S. 2019b. Innovation and economic growth: Does Internet matter? *MPRA Paper 94851, University Library of Munich, Germany.*

[10] Bakari, S., and Tiba, S 2019. The impact of trade openness, foreign direct investment and domestic investment on economic growth: New evidence from Asian developing countries, *Economic Research Guardian, Weissberg Publishing*, 9(1): 46-54.

[11] Bakari, S., Tiba, S., and Fakraoui, N. 2019. Does domestic investment contribute to economic growth in Uruguay? What did the empirical facts say? *Journal of Smart Economic Growth,* 4(2).

[12] Bakari, S, Tiba, and Mabrouki, M 2020. An exploratory study of the causality between internet use, innovation, and economic growth in Tunisia: An indispensable case analysis, *MPRA Paper 100610, University Library of Munich, Germany.*

[13] Bakari, S., and Tiba, S, 2020. The Impact of Internet on economic growth in North Africa: New empirical and policy analysis, *MPRA Paper 100609, University Library of Munich, Germany.*

[14] Barro, R.J. 1997. *Determinants of Economic Growth. Cambridge*, MA:The MIT Press. DOI:10.3386/w5698

[15] Choi, C. 2003. Does the Internet stimulate inward foreign direct investment? *Journal of Policy Modeling*, 25(4): 319–326. DOI: 10.1016/S0161-8938(02)00202-8

[16] Choi, C. 2010. The effect of the Internet on service trade. *Economics Letters*, 109(2): 102–104. DOI: 10.1016/j.econlet.2010.08.005

[17] Choi, C., and Yi, M.H. 2009. The effect of the Internet on economic growth: Evidence from cross-country panel data. *Economics Letters*, 105(1): 39–41. DOI: 10.1016/j.econlet.2009.03.028

[18] Coe, D.T., and Helpman, E. 1995. International R&D Spillovers. *European Economic Review,* 39(5): 859–887. DOI:10.1016/0014-2921(94)00100-E

[19] Freund, C., and Weinhold, D. 2004. The effect of the Internet on international trade. *Journal of International Economics,* 62: 171–189. DOI: 10.1016/S0022-1996(03)00059-X

[20] Gingo, H.U., and Demireli, E. 2018. Analysis of the effect of foreign direct investment on economic growth: The case of Ghana. *International Journal of Contemporary Economics and Administrative Sciences*, 7(34): 119-138.

[21] Mohamed, M., Singh, J.K., and Chung-Yee, L. 2013. Impact of foreign direct investment and domestic investment on economic growth of Malaysia. *Malaysian Journal of Economic Studies*. 50(1): 21-35, 2013.

[22] Noh, Y.-H., and Yoo, K. 2008. Internet, inequality and growth, *Journal of Policy Modeling*, 30(6): 1005–1016. DOI: 10.1016/j.jpolmod.2007.06.016

[23] Olanrele, I.A 2019. Structural breaks, electricity generation and economic growth in Nigeria. *The Economics and Finance Letters*, 6(2): 170-177.

[24] Romer, P.M. 1990. Endogenous technological change. *Journal of Political Economy*, 98(5, Part 2): 71–102. DOI: 10.1086/261725

[25] Sulub, Y.A, Hamid, Z., and Nazri, M.N.M. 2020. Renewable energy supply and economic growth in Malaysia: An application of bounds testing and causality analysis. *International Journal of Energy Economics and Policy*, 10(3): 255-264.

[26] Yi, M.H., and Choi, C. 2005. The effect of the Internet on inflation: Panel data evidence. *Journal of Policy Modeling,* 27: 885–889. DOI: 10.1016/j.jpolmod.2005.06.008

APPENDIX Tables

Table 1. Statistics

	Y	DK	DNET	GOV	INF	OP	P	RD
Mean	1.717912	-0.003606	0.317553	19.14435	1.834660	48.74383	0.500996	
Median	1.859126	0.002055	0.079631	19.36864	1.768577	50.70017	0.483832	
Maximum	6.868609	0.079442	3.150659	24.52714	7.461783	88.67084	1.409247	
Minimum	-5.697152	-0.115852	-0.092234	13.59949	-1.352837	16.01388	-1.853715	
Std. Dev.	1.868528	0.032142	0.463328	2.643670	1.325765	18.31062	0.448219	
Skewness	-1.119396	-0.689914	2.303299	-0.099341	0.717644	0.028030	-0.591981	
Kurtosis	5.864620	3.523031	10.80678	2.520272	4.894795	2.289990	5.409600	
Jarque-Bera	107.9489	17.14772	647.0618	2.201843	46.14410	4.142595	58.86484	
Probability	0.000000	0.000189	0.000000	0.332565	0.000000	0.126022	0.000000	
Sum	336.7107	-0.681495	60.01755	3752.292	359.5934	9553.792	98.19524	
Sum Sq. Dev.	680.8222	0.194222	40.35841	1362.853	342.7424	65379.33	39.17560	
Observations	196	189	189	196	196	196	196	155

Source: Authors' calculations using Eviews 10 software

Table 2. Panel estimation models

Dependent Variable: Y									
Method	Pooled OLS	Pooled OLS Fixed Effect	Pooled OLS Random Effect	GMM	GMM Fixed Effect	GMM Random	2SLS	2SLS Fixed Effect	2SLS Random
C	3.003574**	2.269230**	2.408247**	3.003574**	2.269230**	2.408247**	3.003574**	2.269230**	2.408247**
	(1.309766)	(1.061796)	(1.045964)	(1.309766)	(1.061796)	(1.045964)	(1.309766)	(1.061796)	(1.045964)
DK	43.36928***	22.16952***	30.88356***	43.36928***	22.16952***	30.88356***	43.36928***	22.16952***	30.88356***
	(4.346661)	(4.236097)	(3.883537)	(4.346661)	(4.236097)	(3.883537)	(4.346661)	(4.236097)	(3.883537)
DNET	1.136623***	-0.347743	0.557477	1.136623***	-0.347743	0.557477	1.136623***	-0.347743	0.557477**
	(0.354498)	(0.489641)	(0.376490)	(0.354498)	(0.489641)	(0.376490)	(0.354498)	(0.489641)	(0.376490)
INTER	-35.8064***	-4.650595	-18.24409**	-35.8064***	-4.650595	-18.24409**	-35.8068***	-4.650595	-18.2440***
	(10.39975)	(8.867837)	(8.443539)	(10.39975)	(8.867837)	(8.443539)	(10.39975)	(8.867837)	(8.443539)

Dependent Variable: Y									
Method	Pooled OLS	Pooled OLS Fixed Effect	Pooled OLS Random Effect	GMM	GMM Fixed Effect	GMM Random	2SLS	2SLS Fixed Effect	2SLS Random
P	0.989687***	0.920244***	0.969311***	0.989687***	0.920244***	0.969311***	0.989687***	0.920244***	0.969311***
	(0.272065)	(0.224188)	(0.215810)	(0.272065)	(0.224188)	(0.215810)	(0.272065)	(0.224188)	(0.215810)
OP	0.020667***	0.021909***	0.021239***	0.020667***	0.021909***	0.021239***	0.020667***	0.021909***	0.021239***
	(0.007868)	(0.006159)	(0.006086)	(0.007868)	(0.006159)	(0.006086)	(0.007868)	(0.006159)	(0.006086)
GOV	-0.18775***	-0.13568***	-0.156512***	-0.18775***	-0.13568***	-0.156512***	-0.18775***	-0.13568***	-0.15651***
	(0.056103)	(0.044967)	(0.044070)	(0.056103)	(0.044967)	(0.044070)	(0.056103)	(0.044967)	(0.044070)
INF	0.021644	-0.033245	0.008601	0.021644	-0.033245	0.008601	0.021644	-0.033245	0.008601
	(0.128634)	(0.125402)	(0.115385)	(0.128634)	(0.125402)	(0.115385)	(0.128634)	(0.125402)	(0.115385)
RD	0.260837	0.294721*	0.305335*	0.260837	0.294721*	0.305335*	0.260837	0.294721*	0.305335*
	(0.213917)	(0.167747)	(0.165498)	(0.213917)	(0.167747)	(0.165498)	(0.213917)	(0.167747)	(0.165498)
Hausman Test									
Chi-Sq. Statistic	32.531219			32.531219			32.531219		
Chi-Sq. d.f.	8			8			8		
Prob.	0.0001			0.0001			0.0001		
Observations	155	155	155	155	155	155	155	155	155
R^2	0.528343	0.771648	0.424498	0.528343	0.771648	0.424498	0.528343	0.771648	0.424498
R^2 adjusted	0.502499	0.716401	0.392963	0.502499	0.716401	0.392963	0.502499	0.716401	0.392963
No of countries	7	7	7	7	7	7	7	7	7

Note: ***, ** and * denote significances at 1%, 5% and 10% levels, respectively; ( ) denote Std. Error
Source: Authors' calculations using Eviews 10 software