

Mechanisms of Export Diversification in Resource-Rich Economies: An Empirical Analysis of Azerbaijan's Non-Oil Sector

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Abstract

This study examines the mechanisms of export diversification in Azerbaijan's non-oil sector within the broader context of resource-rich economies and global economic transformation. It analyses Azerbaijan's continuing dependence on oil and gas exports and evaluates the factors shaping the expansion of non-oil export capacity. The study combines comparative analysis, synthesis, systematisation, generalisation, statistical evaluation, correlation and simple regression analysis. The empirical component tests the relationship between selected policy and structural variables, including credit investments and technological innovation expenditure, and non-oil export performance. The findings show that Azerbaijan has made progress in developing non-oil sectors, industrial parks, logistics infrastructure, and post-conflict economic regions.

However, the export structure remains highly concentrated in mineral fuels and related products. The analysis also indicates that credit expansion and innovation-related expenditures have not yet generated sufficient structural change in export composition. Weak innovation capacity, limited high-technology production, insufficient investment in non-oil industries, and underdeveloped export-oriented manufacturing continue to constrain diversification.

The study highlights the potential role of the Alat Free Economic Zone, the Middle Corridor, the Zangazur transport corridor, and the liberated territories in strengthening non-oil export capacity. The paper concludes that Azerbaijan needs a more coherent export diversification strategy based on innovation, industrial clusters, import substitution, green energy, and targeted state support.

Keywords: export diversification; Azerbaijan; non-oil economy; industrial policy; economic transformation; trade competitiveness.

JEL Classification: F14; O13; Q33; O25.

Introduction

Contemporary global transformations and challenges have generated new geopolitical and economic realities. Against this backdrop, the enhancement and optimization of existing mechanisms governing trade and economic relations between nations have become a pressing imperative. The accelerated development of high technologies, particularly the proliferation of the Internet of Things (IoT), and the rapid integration of multifunctional digital mechanisms into economic processes have significantly reshaped the global economic landscape. Artificial intelligence (AI) tools are expanding into virtually all sectors of the economy, exerting a profound influence on foreign trade relations as well. Azerbaijan's international economic profile has traditionally been defined by its specialization in oil and gas exports, and the country has emerged as a strategic energy partner for Europe, currently supplying natural gas to twelve European countries.

Moreover, Azerbaijan has positioned itself as a principal initiator and financier of critical regional energy and transport projects (Aliyev et al., 2023). The construction and operation of major oil and gas export pipelines with strategic significance have been realized largely through the country's efforts. In addition, Azerbaijan is establishing a free trade zone on the Caspian Sea coast in the Alat settlement. A comprehensive port infrastructure has already been constructed, and a portion of the trade flow between Europe and Asia is now being routed through the Port of Alat. The port's throughput capacity is projected to reach 25 million tons per year in the near future (Aliyev, 2025a). Among the trade routes contributing positively to export diversification is the Trans-Caspian International Transport Corridor, also known as the Middle Corridor. Freight transport along this route currently stands at 4 million tons per year, with potential to increase to 15 million tons or more. Another critical development is the anticipated opening of the Zangazur Global Transport and Logistics Corridor, a sovereign initiative of the Republic of Azerbaijan. The commissioning of this corridor is expected to significantly boost regional cargo volumes. This development will also enhance Azerbaijan's capacity to leverage productive trade sources with regional partners, particularly the Turkic countries (Aliyev, 2025b).

These advancements are projected to play a pivotal role in diversifying Azerbaijan's export potential. To this end, it is imperative to effectively utilize both the country's existing potential and the newly emerging opportunities. The formulation of an export concept aligned with these new global realities, as well as the implementation of strategic measures aimed at expanding and diversifying the export structure, remains a critical national priority.

2. Literature Review

In the contemporary era, the development of a non-oil-based economy and the enhancement of its export potential have become increasingly critical issues. Numerous Azerbaijani and international researchers have contributed to the discourse on this subject, offering a variety of scientific and methodological perspectives.

Within the field of Azerbaijani economic science, the scholarly contributions of Muradov & Hajiyev (2014) have played a notable role in shaping conceptual approaches to the country's development model. His works have particularly highlighted the challenges associated with diversifying Azerbaijan's non-oil economy. Furthermore, Muradov & Hajiyeva (2022) have explored conceptual issues related to the reconstruction and regulation of economic activity in post-conflict territories. Among the prominent contemporary researchers in Azerbaijan, as Hajiyeva & Karimli (2021) have offered valuable academic and practical insights into global challenges facing the national economy, with a particular focus on the revitalization of territories liberated from occupation.

Key issues concerning economic diversification, the development of the non-oil sectors, and the assessment of export potential have also been addressed by a group of scholars including Shakaraliyev & Shakaraliyeva (2019) for instance, emphasized the importance of modernizing non-oil industries, while Mamedov & Aliyev (2020) explored the advantages and urgency of economic digitalization. Aliyev (2020a, 2025a, 2025b) has published extensively on the contemporary challenges of Azerbaijan's economy, identifying the constraints affecting the growth of the non-oil sectors and underscoring the necessity of export diversification and economic development in post-conflict regions.

A wide array of other researchers has dedicated studies to various aspects of the non-oil economy's potential and export opportunities. Niftiyev (2020, 2022) has conducted analytical studies on Azerbaijan's economic capacity and development challenges, while Seyfullayev (2020) addressed broader issues of economic growth. Hasanov et al. (2022), investigated the formation of non-oil GDP. Farzaliyev's (2020) work focused on mechanisms for enhancing export potential within the non-oil sector. In addition, Gulahmadov & Huseyn (2023), along with Gulahmadov & Hajiyeva (2013), highlighted the strategic significance of the Zangazur Corridor in fostering regional integration. Hajiyeva (2020) emphasized the need to modernize the country's trade logistics infrastructure, while Huseynli (2022) proposed a set of comprehensive measures aimed at expanding the export capacity of the non-oil sectors to support national economic growth.

International scholars have also addressed the challenges of economic development and export structure enhancement. Ashamsi (2021) analysed the economic development trajectories in the South Caucasus, while Muhammed & Nuri (2022) investigated priorities in foreign trade development, with particular emphasis on the role of foreign investment.

Taken together, these studies underline the strategic importance of foreign trade in accelerating national economic development. Nevertheless, there remains a clear need to deepen fundamental research aimed at formulating actionable mechanisms and operational concepts that can facilitate the diversification of Azerbaijan's export structure and strengthen its non-oil export capacity in alignment with emerging global conditions.

Recent literature on resource-rich economies emphasizes that export diversification is constrained by structural dependence on hydrocarbon exports. In oil-exporting economies, high oil rents may weaken incentives to develop non-oil tradable sectors and may reinforce symptoms of resource dependence.

Kihal (2025), using panel data for oil-exporting MENA countries, shows that digitalization supports non-oil export diversification, whereas oil rents and domestically oriented entrepreneurship may hinder diversification. Similarly, Jolo et al. (2022) find that financial development, domestic credit, human capital, and capital formation are important drivers of diversification in resource-rich countries. These findings support the argument that export

diversification requires not only sectoral expansion but also productivity growth, financial deepening, and technological upgrading. Regional evidence from resource-abundant economies also indicates that SME development can counteract the export concentration associated with natural resource extraction (Vasilyeva et al., 2022).

The Azerbaijan-specific literature also highlights the persistence of export concentration and the need for structural transformation. Huseynov et al. (2023) show that Azerbaijan's export structure remains highly concentrated and argue that specialized financial institutions, public-private partnerships, and targeted non-oil sector policies are needed to support diversification. Das et al. (2022), using a computable general equilibrium model, demonstrate that improvements in state-owned enterprise efficiency and higher non-mineral investment can contribute to Azerbaijan's economic diversification and growth potential. These studies are particularly relevant because they show that Azerbaijan's diversification challenge is not only sectoral but also institutional and financial.

Several studies identify specific non-oil sectors and policy instruments that can support Azerbaijan's export transformation. Mekhraliyeva & Mamedov (2021) emphasize the export potential of agriculture, agro-industrial parks, chemical products, and metallurgy. Najafzade (2025) draws attention to the financing problems of Special Economic Zones in Azerbaijan and argues that excessive reliance on state funding may delay their development. Comparative evidence also shows that industrial zones and Special Economic Zones can improve firm performance and export diversification when they are linked to innovation, financial support, and institutional reform (Adeoti et al., 2025; Zhan & Zhang, 2024). Therefore, the literature suggests that industrial policy can support export diversification, but its effectiveness depends on whether policy instruments generate higher value-added production, technological capability, and stronger integration into international markets.

3. Methodology and Conceptual Framework

This study employs a comprehensive methodological approach grounded in established scientific techniques and original conceptual reasoning. The methodology integrates theoretical abstraction, comparative analysis, synthesis, systematization, generalization, and statistical evaluation to examine contemporary economic developments and structural shifts in Azerbaijan's trade and export landscape. The study also draws extensively on the methodological perspectives and academic contributions of various scholars. Particular emphasis was placed on scientific articles published within the last five years, which were used as key literature sources to ensure the relevance and currency of the research findings.

In addition to the descriptive and comparative evaluation, the study employs correlation and simple regression analysis to provide an empirical test of the relationship between selected structural and policy-related variables and Azerbaijan's non-oil export performance. The dependent variable is non-oil export volume, while the main explanatory variables include credit investments, technological innovation expenditure, and indicators related to the development of non-oil industrial activity. Given the limited number of annual observations, the empirical analysis is designed as an exploratory test rather than a full causal econometric model. Pearson correlation coefficients are first used to identify the direction and strength of association between the selected variables. Simple ordinary least squares regression models are then estimated to examine whether credit investments and technological innovation expenditure are positively associated with non-oil export performance.

The results are interpreted cautiously, with emphasis on association rather than causality, and are used to strengthen the analytical discussion on the effectiveness of industrial policy and export diversification mechanisms in Azerbaijan. The choice of financial and innovation-related variables is consistent with recent evidence showing that domestic credit, capital formation, and technological innovation are important conditions for diversification and export performance in resource-rich and industrializing economies (Jolo et al., 2022; Wu et al., 2022).

The investigation is guided by a set of research hypotheses that reflect critical issues in economic transformation, technological advancement, and export diversification in the context of global challenges and national priorities. These hypotheses are as follows:

H1: Credit investments positively affect Azerbaijan's non-oil export performance.

H2: Technological innovation expenditure positively affects non-oil export performance.

H3: The development of the non-oil manufacturing sector positively contributes to export diversification.

H4: Industrial policy instruments (industrial parks, SEZs, logistics corridors) contribute positively to export diversification.

4. Results and Analysis

The development and strengthening of Azerbaijan's economic development model have prioritized the advancement of the non-oil and gas sectors. In particular, the diversification of the export structure within the non-oil and gas industries is regarded as a strategically significant objective. The elevation of the non-oil and gas sector to a new level of development, driven by advanced technologies, has accelerated with the establishment of techno-parks, industrial parks, industrial zones, and agro-parks. These initiatives aim to create a competitive and export-oriented network of enterprises not only in central cities but also across regional areas of the country. Significant progress has been made, exemplified by the commissioning of large export-oriented production facilities at the Sumqayit industrial hub, marking the beginning of the expansion of the non-oil export structure (Aliyev, 2020b). The scientifically grounded development of the agricultural sector, the application of high-tech solution, including "smart" technologies, in regions, the creation of new export-oriented enterprises, the organization of trade and logistics centers, and the enhancement of infrastructure networks collectively constitute a robust foundation for increasing the export potential of the non-oil sector. Additionally, mechanisms for state support to entrepreneurial entities have been reinforced to further stimulate this growth. It is noteworthy that in recent years, the non-oil sector has demonstrated substantial growth rates, accompanied by a dynamic increase in non-oil exports.

Concurrently, innovative economic mechanisms have begun to be more widely implemented to enhance the export potential of Azerbaijan's non-oil sector (Guliyeva, 2020). Particular emphasis is placed on the role of newly established economic activity mechanisms, including multifunctional techno-parks, in boosting export capacity. Techno-parks are broadly recognized as attractive hubs for potential investors, playing a crucial role in the development of non-oil industries and the increase of export-oriented production. These techno-parks offer modern production-innovation infrastructure provided by the state to entrepreneurs and business entities, accompanied by tax incentives valid for up to ten years and exemption from customs duties. Their multifunctional role is particularly significant in supporting small and

medium-sized enterprises in regional areas, increasing economic activity, enhancing export potential, introducing modern technologies and management practices, and attracting investments. From this perspective, the efficient application of techno-parks and other multifunctional mechanisms is essential for the development of the non-oil sector and the enhancement of its export potential. Challenges related to these mechanisms must be addressed comprehensively and systematically to ensure sustainable progress (Khalilov et al., 2020).

The 44-day Patriotic War, which commenced on September 27, 2020, has ushered in new realities following the Great Karabakh Victory. In the territories liberated from occupation, the Karabakh and Eastern Zangazur economic regions have been established. A large-scale infrastructure network is currently being developed in these areas, accompanied by initiatives aimed at building export-oriented economic infrastructure. Projects based on “smart” technologies are being implemented, with nearly 30 transport projects of national and international significance underway. The international airports of Fuzuli and Zangilan have commenced operations, while the construction of Lachin International Airport was completed in 2025 and is expected to become operational shortly. To meet local demand and expand the structure and volume of export-oriented production, the expansion of the industrial park in Agdam and the “Araz Valley Economic Zone” in Jabrayil is being accelerated. The imminent commissioning of the Zangazur corridor is anticipated to further enhance the region’s investment appeal, expand foreign economic relations, and significantly increase the export potential of Azerbaijan’s non-oil and gas sectors. The restoration of solar energy infrastructure has also begun in the liberated territories. Cooperation with BP in this field is expected to enable future energy exports to Europe (Aliyev, 2025c). Notably, on October 26, 2023, the Garadagh Solar Power Plant was inaugurated. In addition, a major wind energy project is being implemented in Khizi district.

A particular point of emphasis is the transition to a new phase in Azerbaijan’s economic diversification and development model enhancement, as strategic roadmaps have been in effect for some time. This new phase highlights goals with longer-term and more comprehensive perspectives. The primary objective is the intensified application of advanced technologies and innovative functions, alongside the reduction of the economy’s dependence on the oil and gas sector. In this regard, the Order of the President of the Republic of Azerbaijan on “Azerbaijan 2030: National Priorities for Socio-Economic Development” approved on February 2, 2021, holds great significance. To ensure the systematic and planned implementation of these national priorities, the “Socio-Economic Development Strategy of the Republic of Azerbaijan for 2022-2026,” approved by the Presidential Order dated July 22, 2022, is currently being successfully executed. High priority is given to the application of advanced, including “smart,” technologies in the non-oil and gas sectors, the formation and development of a green economy, the expansion of alternative energy infrastructure, and the establishment of modern processing complexes. Another crucial initiative is the intensive implementation of the “First State Program on the Great Return to the Liberated Territories of the Republic of Azerbaijan,” approved by the Presidential Order on November 16, 2022. As the Great Return processes accelerate, opportunities to establish processing enterprises and efficiently utilize the potential of the non-oil and gas sectors increase.

These factors underscore the fundamental necessity of conducting comprehensive research on the development challenges of Azerbaijan's non-oil sector export potential (Majidli & Guliyev, 2020). Consequently, new theoretical and conceptual perspectives have been developed for the development of the non-oil sector and the formation of its export potential. It is essential to conduct a macroeconomic analysis and objective evaluation of the development of the non-oil sector in Azerbaijan, particularly focusing on the characteristics of export potential growth.

Furthermore, the development of organizational and economic mechanisms to utilize innovations and advanced technologies for increasing this potential is imperative. Ultimately, identifying directions to strengthen the export potential of the non-oil sector based on these foundations is of paramount importance (Aliyev, 2020a). Between 2010 and 2024, the share of the non-oil and gas sector in GDP increased from 42.5 billion AZN to 126.3 billion AZN. This trend over the last decade has laid a solid foundation for minimizing the country's economic dependence on the oil and gas sector (see Table 1).

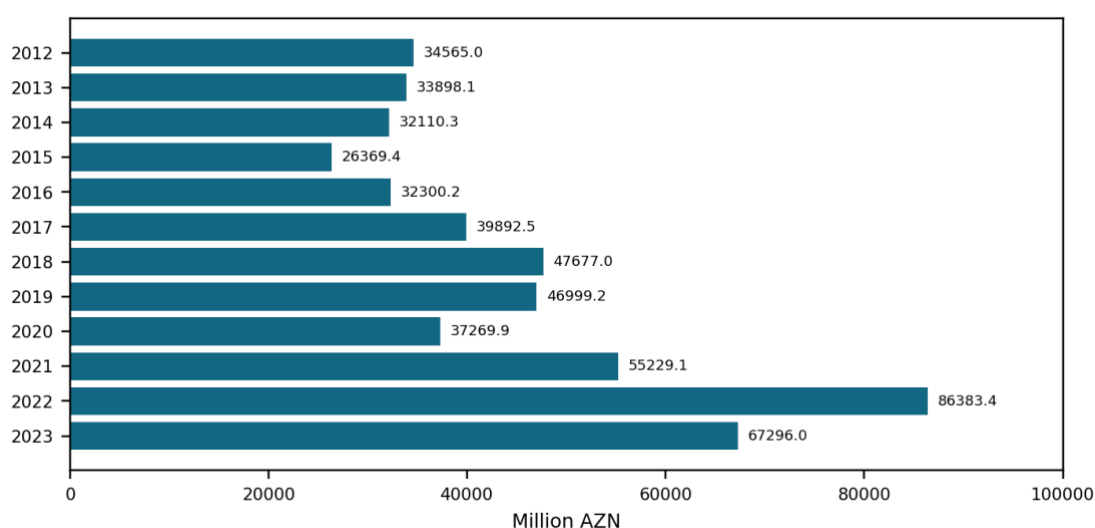
Table 1: GDP in Oil and Non-Oil Sectors, Azerbaijan, 2010–2024 (billion AZN)

Indicators	2010	2015	2016	2017	2018	2019	2020	2023	2024	2010-2024: growth multiple
Total Gross Domestic Product, including	42.5	54.4	60.4	70.3	80.1	81.9	72.4	123.0	126.3	2.97
Oil and gas sector	20.4	15.4	19.6	25.0	32.2	30.1	20.6	45.3	40.6	1.99
Non-oil and gas sector	19.2	34.1	36.0	40.3	41.7	44.5	44.9	77.7	85.7	4.46

Note: Compiled by authors. Data from Azerbaijan's State Statistical Committee <https://www.stat.gov.az>

Figure 1 illustrates the dynamics of industrial production volume in the Republic of Azerbaijan during the period 2012–2023. The analysis indicates that the volume of industrial production has nearly doubled over the analysed period.

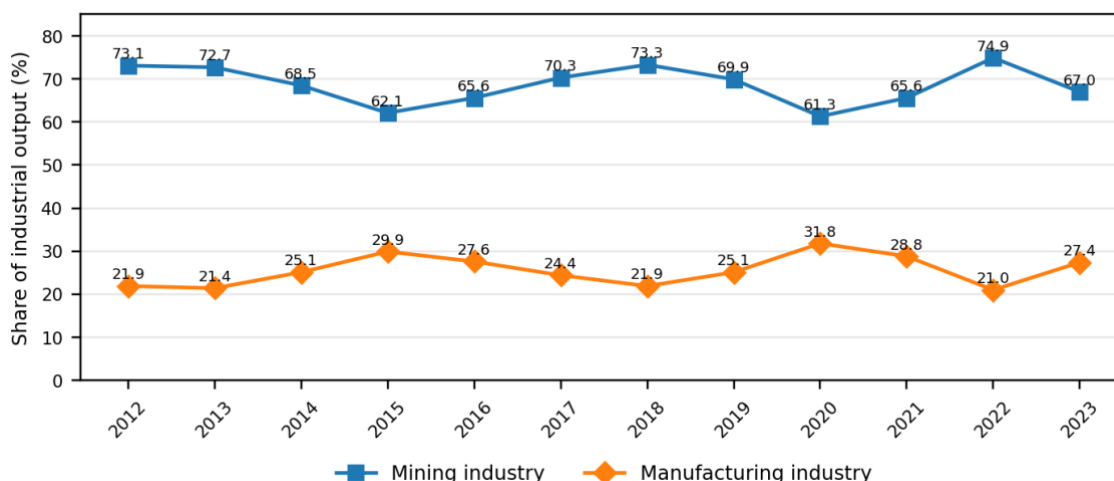
Figure 1. Dynamics of Industrial Production Volume in Azerbaijan 2012–2023, million AZN.



Note: Compiled by authors. Data from Azerbaijan's State Statistical Committee <https://www.stat.gov.az>

In the Figure 2, the structure of industrial output in Azerbaijan during the period 2012–2023 is analysed in terms of the share of the mining and manufacturing industries. The analysis reveals that in 2023, the manufacturing industry, which constitutes a significant portion of the non-oil and gas sector, increased by 6.4%.

Figure 2. Non-Oil Industrial Output by Sector, Azerbaijan, 2023 (million AZN and %)

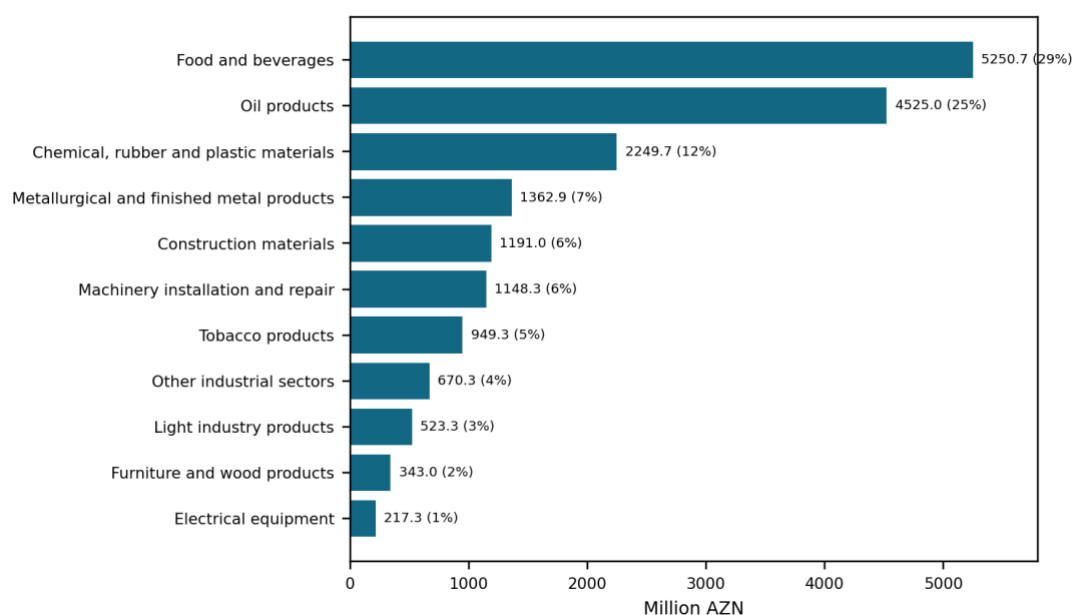


Source: Authors' Compilation. Data from Azerbaijan's State Statistical Committee <https://www.stat.gov.az>

It can be asserted that notable progress has been achieved in the structural transformation of Azerbaijan's non-oil and gas industry, with increasing emphasis on the development of high-technology-based production infrastructure. In particular, the expansion of export-oriented and internationally competitive industrial output has become a strategic priority within the broader agenda of economic diversification.

Figure 3 illustrates the composition of the total output of the non-oil and gas industry in Azerbaijan for the year 2023.

Figure 3. Non-Oil Industrial Output by Sector, Azerbaijan, 2023 (million AZN and %)



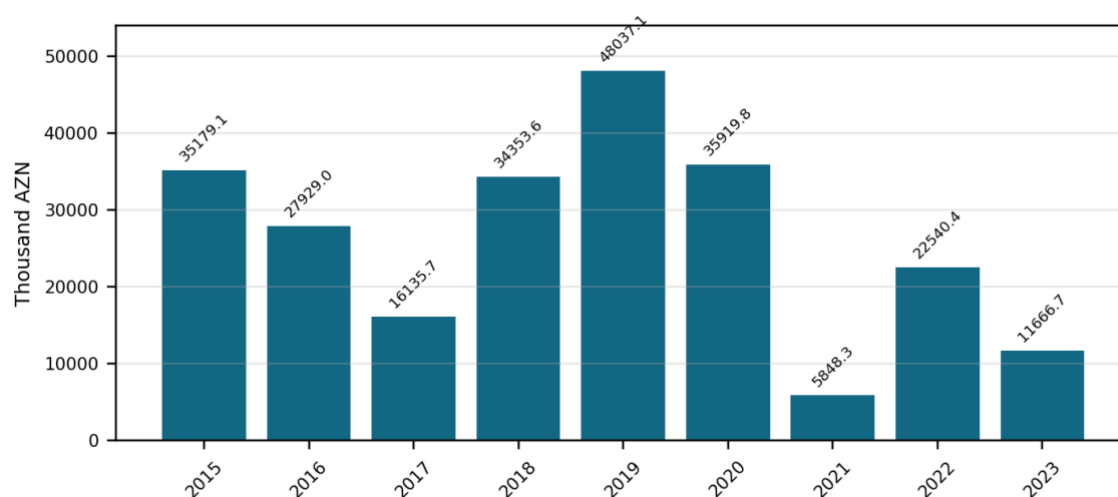
Source: Authors' Compilation. Data from Azerbaijan's State Statistical Committee <https://www.stat.gov.az>

The analysis reveals that significant proportions are concentrated in food production, the chemical industry, rubber and plastic manufacturing, tobacco products, petroleum-derived goods, and metallurgy-related outputs. Nevertheless, a critical evaluation indicates that the sector's latent potential remains considerably underexploited. The variety of innovation-driven and high-tech-intensive export products is still limited, and the modernization of several industrial subsectors is yet to be fully realized. Furthermore, the development and global positioning of national brands continue to face systemic challenges, reflecting a need for more coherent industrial policies and targeted support mechanisms.

As noted earlier, there is a critical need to undertake systematic measures aimed at the production of high value-added export products and technologically competitive export goods, which form the basis of innovations. However, unfortunately, the organization of similar initiatives and the associated financial mechanisms remain significantly weak.

As illustrated in Figure 4, the dynamics of expenditures related to the application of technological innovations and operational directions in the industrial sector of the Republic of Azerbaijan from 2015 to 2023 reveal that financial resources allocated for these purposes have been minimal.

Figure 4. Technological Innovation Expenditure in Azerbaijan's Industrial Sector, 2015–2023 ('000 AZN)



Source: Compiled based on data from State Statistical Committee of Azerbaijan
<https://stat.gov.az/source/industry/>

The formation of the innovation system in the country and the structure of the production of competitive, innovation-driven products are also significantly weak.

Table 2 analyses the volume of improved innovative products by economic activity sectors in Azerbaijan for the period 2012–2023. As can be seen, innovative products have been produced in very few sectors of the economy. However, precise statistical data regarding the export of these products has not been provided. Overall, it is considered that there is a need for large-scale investment-innovation projects focused on the production of export-oriented innovative products.

Table 2: Innovative Products by Economic Activity, Azerbaijan, 2015–2023 ('000 AZN)

Types of economic activity	2015	2017	2018	2019	2020	2021	2022	2023
Industry – total	589.7	383.8	855.3	3,905.9	16,828.4	8,305.8	38,662.6	19,254.5
Mining industry	-	183.8	-	-	-	-	-	-
Manufacturing industry, including:	589.7	200.0	855.3	3,905.9	16,828.4	8,305.8	38,662.6	19,254.5
Production of food products		-	-	21.0	-	-	17,692.7	5,000.0
Production of beverages	...	-	-	-	-	-	-	-
Textile industry	...	-	-	-	-	-	-	-
Clothing industry		-	-		-	-		-
Production of leather and leather goods, and footwear		-	-	-	-	-	-	-
Wood processing and production of wood products	...	-	-	-	-	-	-	-
Production of petroleum products	...	-	-	-	-	-	-	-
Chemical industry	...	-	738.0	-	-	-	-	-
Production of rubber and plastic products		-	-	-	-	-	-	-
Production of construction materials		-	-	-	-	-	-	-
Metallurgical industry		-	-	3,852.0	16,800.0	8,289.7	20,937.0	14,220.0
Production of metal products except machinery and equipment	...	-	-	-	-	-	-	-
Production of computers and other electronic equipment	...	-	-	-	-	-	-	-
Production of electrical equipment	...	-	-	-	-	-	-	-
Production of machinery and equipment	430.0	167.1	82.8	-	-	-	-	-

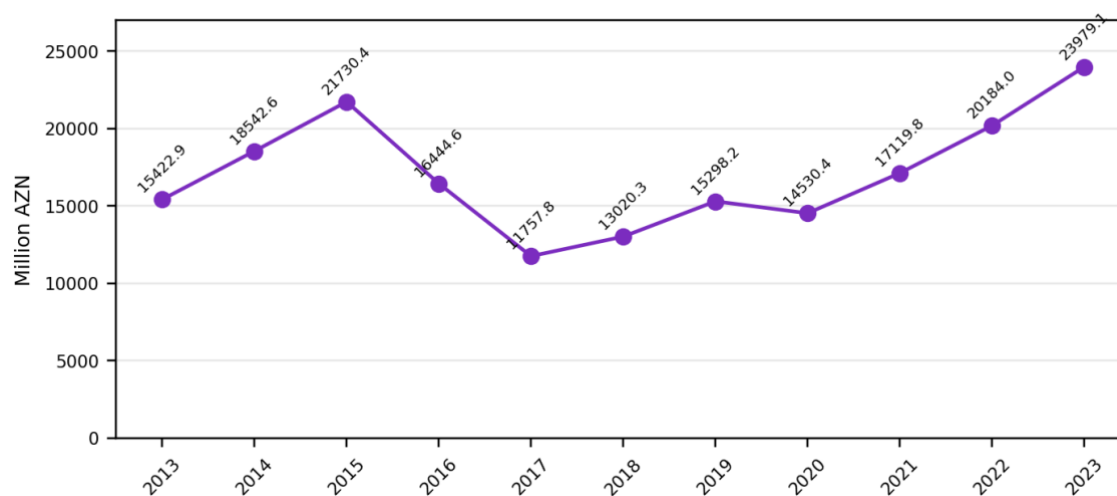
Types of economic activity	2015	2017	2018	2019	2020	2021	2022	2023
Production of furniture	...	-	-	-	-	-	-	-
Installation and repair of machinery and equipment	32.2	32.9	34.5	32.9	28.4	16.1	32.9	-

Note: Authors' Compilation. Data from Azerbaijan's State Statistical Committee <https://www.stat.gov.az>

Accessible credit investments play a crucial role in the development of non-oil and gas industrial sectors and in enhancing their export potential. Overall, there remains a need for measures aimed at increasing credit investments in the country's real economy and establishing concessional business credit packages.

Figure 5 illustrates the dynamics of credit investments in the economy of Azerbaijan during 2013–2023. As observed, there has been a significant increase in credit investments over the past five years. This trend may accelerate the renewal of production infrastructure in non-oil and gas sectors and, in particular, the establishment of export-oriented enterprises. On the other hand, a substantial portion of the allocated credit investments is directed towards the newly established Karabakh and Eastern Zangazur economic regions, which intensifies the creation of high-technology, including “smart” technology-based, non-oil and gas industrial enterprises in the territories liberated from occupation.

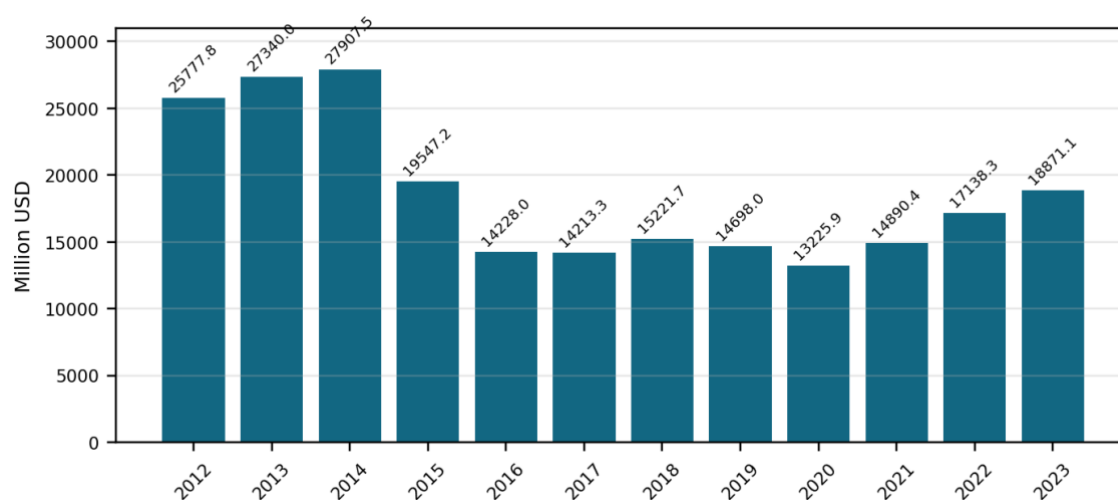
Figure 5. Dynamics of credit investments in the economy of Azerbaijan, 2013–2023, million AZN



Source: Central Bank of the Republic of Azerbaijan, <https://www.cbar.az/page-40/statistical-bulletin>).

We would like to draw special attention to the need for economic diversification and the continuous attraction of investments, particularly in the non-oil and gas sectors. It is well known that Azerbaijan's oil and gas industry possesses stronger investment appeal. However, this cannot be similarly applied to the non-oil and gas industries. Despite the state's implementation of ten-year tax incentives through techno-parks, industrial zones, industrial districts, and agro-parks, investments directed towards the country's non-oil and gas industrial sectors remain at a low level. Overall, there has been no significant increase in the allocation of investments in recent years (see Figure 6).

Figure 6. Total Investment in Azerbaijan, 2012–2023 (million USD)



Source: State Statistical Committee of the Republic of Azerbaijan <https://www.stat.gov.az/>

It should be noted that after the restoration of independence, it took many years to ensure the efficiency of foreign trade relations and the dynamism of foreign trade turnover. As noted earlier, certain measures have been taken by the state to promote exports. These include the establishment of an export portal and the development and implementation of export stimulation mechanisms. Overall, Azerbaijan maintains foreign trade relations with 170 countries. The level of foreign trade relations is characterized as one of the most important indicators determining Azerbaijan’s level of economic development. Specifically, this indicator contributes to increasing the competitiveness of domestic products in global markets and ensuring their free access to these markets, thereby enhancing the country’s international standing. In the modern era, one of the key factors conditioning and accelerating the country’s economic development is the expansion of foreign trade relations, increasing the efficiency of import-export operations, and ensuring that relations between countries align with national interests. Despite this, although Azerbaijan’s foreign trade relations have expanded over the past decades, there remains significant potential for utilizing the export capacity of non-oil and gas sectors. At the same time, it is crucial that the productive use of foreign trade relations and all efforts of the country’s economic diplomacy are directed towards increasing the efficiency of these relations.

Table 3 analyses the dynamics of foreign trade turnover in the Republic of Azerbaijan during 2014–2024.

Table 3: Overall indicators of foreign trade relations of Azerbaijan, 2014–2024 (million USD)

Years	Turnover			Import			Export		
	Total	CIS, %	Non-CIS, %	Total	CIS, %	Non-CIS, %	Total	CIS, %	Non-CIS, %
2014	31,016.3	9.4	90.6	9,187.7	22.7	77.3	21,828.6	3.8	96.2
2015	21,945.8	11.3	88.7	9,216.7	21.3	78.7	12,729.1	4.1	95.9
2016	21,946.7	12.9	87.1	8,489.1	25.4	74.6	13,457.6	4.9	95.1
2017	24,103.3	14.6	85.4	8,783.3	27.3	72.7	15,320.0	7.4	92.6

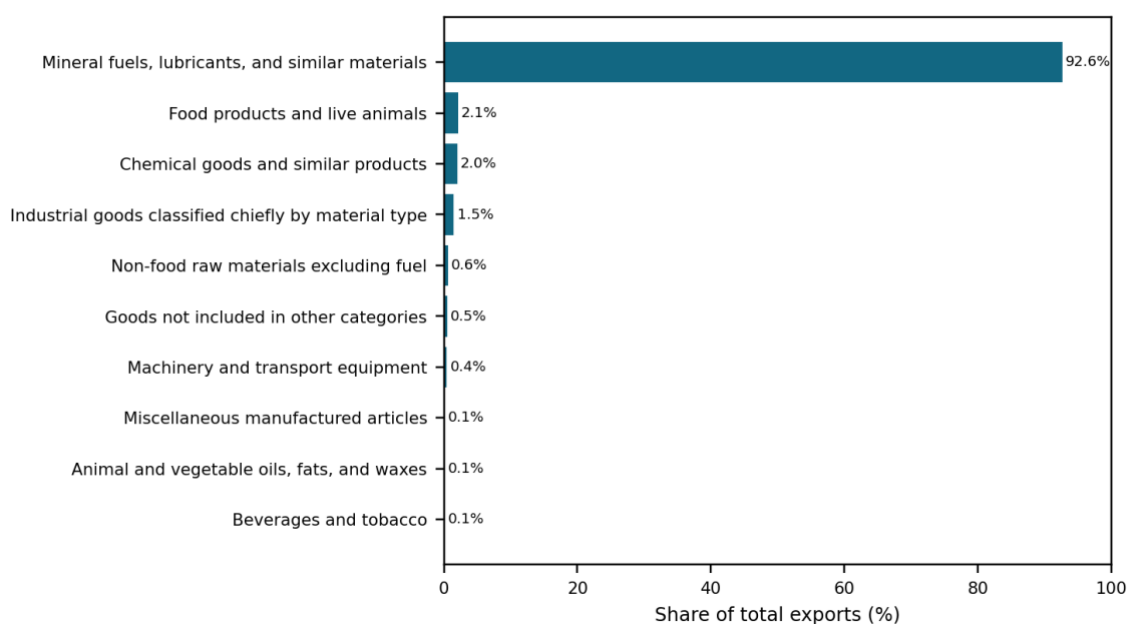
Years	Turnover			Import			Export		
	Total	CIS, %	Non-CIS, %	Total	CIS, %	Non-CIS, %	Total	CIS, %	Non-CIS, %
2018	30,955.0	12.9	87.1	11,465.9	25.0	75.0	19,489.1	5.8	94.2
2019	33,302.7	13.8	86.2	13,667.5	25.1	74.9	19,635.2	6.0	94.0
2020	24,203.5	17.3	82.7	10,732.0	26.1	73.9	13,471.5	9.5	90.5
2021	35,636.8	13.9	86.1	11,703.2	25.0	75.0	23,933.6	8.1	91.9
2022	56,212.1	11.5	88.5	14,539.9	30.4	69.6	41,672.2	4.3	95.7
2023	51,183.9	12.5	87.5	17,285.3	27.6	72.4	33,898.6	4.9	95.1
2024	47,612.1	14.6	85.4	21,058.1	24.8	75.2	26,554.1	6.4	93.6

Source: Compiled by the author based on data from <https://www.stat.gov.az/>

According to the analysis, the overall volume of foreign trade turnover and export volumes have been unstable in recent years. This is primarily due to the fact that over 90% of the country's exports consist of oil and gas raw materials. Imports, however, have been steadily increasing. Considering both the near and long-term perspectives, diversification of the export structure should be ensured.

Figure 7 presents the structure of Azerbaijan's exports for the year 2023 according to the International Standard Industrial Classification (ISIC). As shown, 92.6% of the country's exports are related to oil and gas raw materials. Among other export items, chemicals, petrochemicals, and food products attract the most attention. Significant non-oil and gas export products include polypropylene, carbamide, polyethylene, as well as fruits and vegetables.

Figure 7. Azerbaijan's Export Structure, 2023 (%)



Source: Compiled by the authors

In recent years, the government of Azerbaijan has undertaken extensive efforts to ensure the sustainable and steady development of the non-oil and gas sector, as well as to achieve significant results in this field. These outcomes have been reflected in previous analyses and evaluations conducted by researchers. However, global instability and increasing pressures necessitate a renewed perspective, new mechanisms, and approaches for strengthening Azerbaijan’s non-oil and gas sector and its export potential. Mechanisms and practical tools that were considered effective yesterday must now be improved or newly developed and implemented in accordance with current realities. Furthermore, research works, opinions, and discussions regarding the enhancement of the non-oil and gas sector and its export potential have intensified. Politicians, economists, prominent state and public figures, experts, including foreign specialists, emphasize the importance of increasing the export potential of Azerbaijan’s non-oil and gas sector and intensifying related activities in this area.

4.1. Empirical Test of the Drivers of Non-Oil Export Performance

To strengthen the analytical contribution of the study, this section provides an exploratory empirical test of the relationship between selected structural and policy-related variables and Azerbaijan’s non-oil export performance. The analysis focuses on three explanatory variables: credit investments, technological innovation expenditure, and the share of manufacturing industry in total industrial output. These variables were selected because they represent three important channels through which export diversification may be supported in a resource-rich economy: access to finance, technological upgrading, and productive industrial capacity.

The dependent variable is non-oil export volume, measured in million USD. Credit investments are measured in million AZN, technological innovation expenditure is measured in thousand AZN, and manufacturing industry share is measured as a percentage of total industrial output. The common sample period is 2015–2023, mainly because data on technological innovation expenditure are available for this period. Given the limited number of annual observations, the empirical results should be interpreted as exploratory evidence rather than as definitive causal estimates.

The baseline empirical models are specified as follows: Model 1: Non-oil Export Volume = $\alpha + \beta_1$ Credit Investments + ε . Model 2: Non-oil Export Volume = $\alpha + \beta_1$ Technological Innovation Expenditure + ε . Model 3: Non-oil Export Volume = $\alpha + \beta_1$ Manufacturing Industry Share + ε . Table 4 presents the dataset used in the empirical analysis.

Table 4: Dataset Used for Correlation and Simple Regression Analysis, Azerbaijan, 2015–2023

Year	Non-oil export volume, million USD	Credit investments, million AZN	Technological innovation expenditure, thousand AZN	Manufacturing industry share in industrial output, %
2015	1,581.2	21,730.4	35,179.1	29.9
2016	1,236.7	16,444.6	27,929.0	27.6
2017	1,538.4	11,757.8	16,135.7	24.4
2018	1,689.2	13,020.3	34,353.6	21.9
2019	1,954.9	15,298.2	48,037.1	25.1
2020	1,851.3	14,530.4	35,919.8	31.8
2021	2,713.4	17,119.8	5,848.3	28.8
2022	3,047.7	20,184.0	22,540.4	21.0
2023	3,348.0	23,979.1	11,666.7	27.4

Note: Non-oil export volume is the dependent variable. The 2016 and 2019 values were estimated from official growth rates. Decimal separators follow international standards.

Table 5: Pearson Correlation Matrix

Variables	Non-oil export volume	Credit investments	Technological innovation expenditure	Manufacturing industry share
Non-oil export volume	1.000	0.628	-0.542	-0.160
Credit investments	0.628	1.000	-0.260	0.196
Technological innovation expenditure	-0.542	-0.260	1.000	-0.007
Manufacturing industry share	-0.160	0.196	-0.007	1.000

Note: Pearson correlations for annual data (2015–2023). Variables are measured in million USD, million AZN, '000 AZN, and %, respectively.

Table 5 reports the Pearson correlation matrix. The results show a positive correlation between credit investments and non-oil export volume. The correlation coefficient is 0.628, suggesting a moderate positive association. This finding supports the view that access to financial resources may contribute to the expansion of export-oriented activity in the non-oil sector. In practical terms, credit availability may help firms renew production infrastructure, increase output capacity, and participate more actively in external markets.

The relationship between technological innovation expenditure and non-oil export volume is negative, with a correlation coefficient of -0.542. This result should not be interpreted as evidence that innovation harms export performance. Rather, it suggests that innovation-related expenditures in Azerbaijan have not yet been effectively transformed into export-oriented technological upgrading, higher value-added production, or internationally competitive non-oil goods. This finding is consistent with the descriptive evidence presented earlier, which indicates that the national innovation system remains weak, fragmented, and insufficiently connected to export-oriented industrial production.

The correlation between manufacturing industry share and non-oil export volume is also weak and negative, with a coefficient of -0.160. This result indicates that changes in the share of manufacturing within total industrial output have not been strongly associated with the growth of non-oil exports during the observed period. One possible explanation is that the manufacturing base remains relatively narrow and that a significant part of industrial activity is not yet sufficiently export-oriented. Therefore, increasing the share of manufacturing alone may not be enough unless it is accompanied by technological modernization, product sophistication, and stronger integration into international markets.

Table 6: Regression Results for Non-Oil Export Performance (Dependent Variable: Non-Oil Export Volume, million USD)

Variables	Model 1	Model 2	Model 3
Constant	153.546	2893.391	2,973.667
Credit investments	0.114* (0.053)		
Technological innovation expenditure		-0.030 (0.017)	
Manufacturing industry share			-32.796 (76.600)
t-statistic	2.136	-1.707	-0.428
p-value	0.070	0.132	0.681

Variables	Model 1	Model 2	Model 3
R-squared	0.395	0.294	0.026
Adjusted R-squared	0.308	0.193	-0.114
F-statistic	4.561	2.914	0.183
Observations	9	9	9

Note: Standard errors are in parentheses. $p < 0.10$. Results should be interpreted as exploratory due to the small sample size.

Table 6 presents the results of three simple ordinary least squares regression models. In Model 1, credit investments are positively associated with non-oil export volume. The coefficient is positive and statistically significant at the 10% level. This result provides limited but useful empirical support for the hypothesis that financial deepening can contribute to non-oil export expansion. However, the result should be interpreted with caution because the model is based on a small annual dataset.

In Model 2, technological innovation expenditure has a negative but statistically insignificant coefficient. This finding confirms that innovation spending has not yet become a measurable driver of non-oil export growth in Azerbaijan. The result points to a gap between innovation expenditure and export outcomes. This gap may reflect weak commercialization capacity, limited high-technology production, insufficient private-sector innovation, and the absence of strong linkages between research, industrial production, and international competitiveness. This interpretation is consistent with evidence that the export benefits of technological innovation depend strongly on financial slack and institutional conditions (Wu et al., 2022).

In Model 3, the coefficient of manufacturing industry share is negative and statistically insignificant. This result suggests that the existing manufacturing structure has not yet produced a strong export diversification effect. Although industrial parks, techno-parks, agro-parks, and free economic zones have created an institutional basis for non-oil development, their contribution to export diversification remains partial. The findings therefore indicate that industrial policy has been more successful in creating infrastructure and support mechanisms than in generating a deep structural transformation of the export basket.

Overall, the empirical results support the central argument of the study. Azerbaijan has made visible progress in building institutional, infrastructural, and policy mechanisms for non-oil development. Credit expansion appears to be positively associated with non-oil export performance, which confirms the importance of financial support for export-oriented firms. However, innovation expenditure and manufacturing share do not show strong positive effects. This suggests that the effectiveness of industrial policy remains incomplete. For export diversification to become sustainable, policy mechanisms should move beyond infrastructure creation and general support measures. They should focus more directly on technological upgrading, high-value-added production, industrial clusters, export-oriented manufacturing, and stronger integration into global value chains.

These results also have important implications for the broader discussion on resource-rich economies. In such economies, export diversification requires more than the expansion of non-oil sectors in quantitative terms. It also requires a qualitative transformation of productive capabilities. Azerbaijan's experience shows that financial support, innovation policy, industrial zones, logistics corridors, and free economic zones can provide a foundation for diversification. Nevertheless, their effectiveness depends on whether these mechanisms can produce

competitive non-oil exports, reduce dependence on mineral fuels, and create new sources of long-term trade competitiveness.

5. Discussion: Efficiency of Industrial Policy in Export Diversification

The findings of this study show that Azerbaijan has developed a broad set of industrial policy instruments to support export diversification. These instruments include industrial parks, techno-parks, agro-parks, free economic zones, logistics corridors, innovation-related programs, investment incentives, and state support mechanisms for entrepreneurship. However, the central question is not whether these instruments exist, but whether they have been effective in transforming Azerbaijan's export structure. From this perspective, the evidence suggests that industrial policy has produced visible institutional and infrastructural progress, but its effectiveness in generating sustained non-oil export diversification remains partial and incomplete.

Azerbaijan's industrial policy has been relatively successful in creating the basic conditions for non-oil economic development. The establishment of industrial parks and techno-parks has improved the production environment for firms. Tax incentives, customs exemptions, and state-supported infrastructure have reduced some entry barriers for investors. The development of logistics infrastructure, including the Alat Free Economic Zone, the Middle Corridor, and the Zangazur transport corridor, has also strengthened the country's potential role as a regional trade and transit hub. These mechanisms are important because export diversification in a resource-rich economy requires more than firm-level effort. It also requires infrastructure, institutional support, access to finance, and predictable policy frameworks.

Nevertheless, the results indicate that these policy mechanisms have not yet produced a deep transformation of the export basket. Azerbaijan's exports remain highly concentrated in oil, gas, and mineral-related products. Non-oil exports have increased in recent years, but their scale and technological sophistication remain limited. This suggests that the main weakness of industrial policy is not the absence of support mechanisms, but the limited conversion of these mechanisms into competitive, high-value-added, and export-oriented production. In other words, Azerbaijan has made progress in building the inputs of diversification, but the outputs of diversification remain insufficient.

The empirical results support this interpretation. The positive relationship between credit investments and non-oil export volume suggests that access to finance plays a supportive role in export expansion. This finding is important because firms in the non-oil sector often require credit to renew production capacity, adopt new technologies, increase output, and enter foreign markets. Therefore, credit policy appears to be one of the more effective channels of industrial policy. However, the effect remains limited because credit expansion alone cannot guarantee export sophistication. Financial support must be connected to clear sectoral priorities, export performance targets, and technological upgrading.

The results for technological innovation expenditure are more critical. The negative and statistically insignificant relationship between innovation expenditure and non-oil export performance suggests that innovation spending has not yet become an effective driver of export diversification. This does not mean that innovation is unimportant. On the contrary, it shows that Azerbaijan's innovation system has not yet reached the level required to transform spending into export-oriented technological capability. Innovation expenditure may remain ineffective when it is fragmented, weakly connected to firms, insufficiently commercialized, or

concentrated in activities that do not directly increase export competitiveness. These finding highlights one of the main limitations of current industrial policy: innovation policy and export policy are not yet sufficiently integrated.

A similar conclusion applies to manufacturing industry. The weak relationship between manufacturing industry share and non-oil export volume indicates that manufacturing development has not automatically translated into export diversification. This may be explained by the narrow structure of the manufacturing base, limited technological intensity, and insufficient integration into global value chains. A higher manufacturing share can support diversification only when manufacturing activities produce competitive goods for international markets. Therefore, the effectiveness of industrial policy depends not only on increasing industrial output, but also on improving product quality, technological content, branding, certification, and market access.

The recent literature supports this interpretation. Huseynov et al. (2023) confirm that Azerbaijan's export concentration remains high and that stronger financial and institutional mechanisms are required to support non-oil exports. Das et al. (2022) further show that structural reforms, especially improvements in state-owned enterprise efficiency and higher non-mineral investment, can strengthen Azerbaijan's diversification potential. These findings are consistent with the empirical results of this study, which indicate that credit investments are positively associated with non-oil export performance, while innovation expenditure has not yet translated into measurable export outcomes.

The case of industrial parks and techno-parks is particularly important. These mechanisms can be effective when they generate cluster effects, knowledge spillovers, supplier networks, export-oriented specialization, and innovation-based production. In Azerbaijan, these mechanisms have helped establish a more organized industrial infrastructure. Yet their broader impact on export diversification remains constrained. Many firms still operate in sectors with limited technological depth. The number of high-technology and internationally competitive non-oil products remains low. Therefore, industrial parks should not be evaluated only by the number of resident firms or investment volume. Their performance should also be assessed by export volume, export market diversity, value added, technology use, employment quality, and contribution to domestic supplier networks.

The evidence on Special Economic Zones and development zones provides an important framework for evaluating the efficiency of industrial policy. Najafzade (2025) argues that Azerbaijan's Special Economic Zone development has been constrained by over-reliance on state funding, indicating the need for hybrid public-private financing models. Comparative evidence suggests that Special Economic Zones and development zones are most effective when they combine fiscal incentives with technological upgrading, financial access, management capacity, and institutional reform. Evidence from Nigeria shows that Special Economic Zone incentives can support firm-level innovation and export performance when accompanied by institutional reforms (Adeoti et al., 2025). Similarly, evidence from Chinese exporters indicates that development zone upgrading can increase product export diversification by improving innovation capacity, management efficiency, and financial support (Zhan & Zhang, 2024). This suggests that Azerbaijan should evaluate industrial parks, technoparks, and free economic zones not only by investment volume or infrastructure creation, but also by export performance, technological upgrading, product diversification, and integration into global value chains.

The Alat Free Economic Zone and the emerging transport corridors offer significant opportunities, but their effectiveness will depend on policy implementation. Free economic zones can attract foreign investment, support re-export activity, and connect domestic producers to international markets. However, they may also remain limited transit or logistics platforms if they are not integrated with domestic production networks. For this reason, Azerbaijan should use the Alat Free Economic Zone not only as a trade and logistics hub, but also as a platform for export-oriented manufacturing, processing industries, and technology-intensive activities. The same logic applies to the Middle Corridor and the Zangazur corridor. These corridors can support diversification only if they are connected to domestic production capabilities.

The liberated territories create another important policy opportunity. Large-scale reconstruction, smart infrastructure, renewable energy projects, agro-industrial development, and new transport connections may create new sources of non-oil export potential. However, the effectiveness of this strategy will depend on whether these territories become production-oriented economic spaces rather than only reconstruction zones. Industrial policy in these regions should prioritize sectors with clear export potential, such as agro-processing, renewable energy components, construction materials, logistics services, food processing, and selected light manufacturing activities.

Overall, the evidence suggests that Azerbaijan's industrial policy has entered a second stage. The first stage focused on creating institutions, infrastructure, incentives, and strategic programs. This stage was necessary and has produced visible progress. The second stage should focus on effectiveness, performance, and measurable export outcomes. Policy success should now be evaluated by whether non-oil sectors can produce technologically upgraded, internationally competitive, and higher value-added goods. This requires a stronger connection between credit policy, innovation policy, industrial policy, and trade policy.

For industrial policy to become more effective, Azerbaijan should move from general support mechanisms toward targeted and performance-based support. Priority should be given to firms and sectors that demonstrate export potential, technological upgrading, productivity growth, and integration into global value chains. Public support should be linked to measurable indicators such as export growth, product diversification, innovation output, local supplier development, and entry into new foreign markets. This approach would reduce the risk of inefficient support and increase the developmental impact of industrial policy.

In conclusion, Azerbaijan's experience confirms that export diversification in resource-rich economies is a long-term structural process. Industrial policy can support this process, but only when infrastructure, finance, innovation, and production capacity are integrated into a coherent strategy. The current policy framework has created an important foundation. However, the empirical and descriptive evidence shows that this foundation has not yet fully transformed the export structure. The main challenge is therefore to increase the efficiency of industrial policy by shifting from institution-building and infrastructure provision toward export-oriented technological upgrading, industrial clustering, and competitive non-oil production.

Conclusion

This study examined the mechanisms of export diversification in Azerbaijan's non-oil sector in the broader context of resource-rich economies. The analysis showed that Azerbaijan has made visible progress in developing institutional, infrastructural, and policy mechanisms to support economic diversification. Industrial parks, techno-parks, agro-parks, free economic

zones, logistics corridors, state support measures, investment incentives, and post-conflict reconstruction programs have created an important foundation for the expansion of non-oil economic activity. However, the findings also demonstrate that these mechanisms have not yet generated a deep and sustained transformation of the country's export structure.

The descriptive evidence confirms that Azerbaijan's export basket remains highly concentrated in oil, gas, and mineral-related products. Although the non-oil sector has expanded and non-oil exports have increased in recent years, export diversification remains limited in terms of scale, technological sophistication, product variety, and international competitiveness. This indicates that Azerbaijan has moved forward in building the institutional and infrastructural inputs of diversification, but the measurable outputs of diversification remain insufficient. Therefore, the central policy challenge is no longer only to create support mechanisms, but to increase their effectiveness in generating competitive, higher value-added, and export-oriented non-oil production.

The empirical results provide additional support for this conclusion. The correlation and simple regression analysis showed a positive relationship between credit investments and non-oil export volume. This suggests that access to financial resources can support the expansion of export-oriented activity in the non-oil sector. Credit investments may help firms renew production infrastructure, expand capacity, adopt new technologies, and enter foreign markets. However, credit expansion alone is not sufficient. It should be linked to sectoral priorities, export performance, technological modernization, and productivity growth.

The results for technological innovation expenditure were more critical. Innovation-related expenditure did not show a positive and statistically significant relationship with non-oil export performance. This finding does not reduce the importance of innovation. On the contrary, it shows that Azerbaijan's innovation system has not yet become an effective driver of export diversification. Innovation spending appears to be weakly connected to export-oriented production, high-technology manufacturing, product upgrading, and international competitiveness. Therefore, the country needs a more integrated policy framework that links innovation policy with industrial policy, export policy, and private-sector development.

The findings also show that manufacturing development has not automatically translated into stronger non-oil export performance. This result reflects the narrow structure of the manufacturing base and the limited technological depth of many non-oil industrial activities. Increasing the share of manufacturing in industrial output is important, but it is not sufficient by itself. Manufacturing growth should be accompanied by higher product quality, stronger certification systems, better branding, deeper supplier networks, and greater integration into global value chains. Without these qualitative improvements, manufacturing expansion may remain weakly connected to export diversification.

One of the key conclusions of the study is that industrial policy in Azerbaijan has been partially effective. It has been effective in creating infrastructure, institutions, incentives, and strategic programs. However, its effectiveness remains incomplete in terms of technological upgrading, export sophistication, and reduction of dependence on oil and gas exports. For this reason, Azerbaijan should move from general support mechanisms toward targeted, performance-based, and export-oriented industrial policy. Public support should be linked to measurable indicators such as export growth, product diversification, innovation output, value added, local supplier development, and entry into new foreign markets.

Customs-tariff regulation remains an important mechanism for improving the structure of foreign trade turnover. Active and efficient use of customs-tariff tools can facilitate export operations, reduce procedural barriers, lower transaction costs, and increase the attractiveness of Azerbaijani products in foreign markets. However, these tools should not be applied only as administrative measures. They should be integrated into a broader export diversification strategy that supports competitive production, simplifies procedures for exporters, and strengthens the international market access of non-oil firms.

State support mechanisms should also be further developed and adjusted in line with current economic realities. Support measures should focus on sectors with clear export potential and measurable competitiveness gains. Agriculture and food processing remain important areas in this respect. Azerbaijan has opportunities to expand the volume and diversity of food exports, strengthen food security, reduce import dependence, and develop export-oriented food processing complexes. These sectors can play a stronger role in non-oil export diversification if they are supported by modern logistics, quality standards, packaging, certification, and access to regional and international markets.

The light industry, including textiles, leather goods, footwear, and related activities, also requires renewed attention. Azerbaijan has traditional experience, domestic demand, and raw material potential in these areas, but current production capacity remains weak. The development of sericulture and textile-related activities should be assessed more systematically. Joint ventures with firms from countries such as Turkey, Italy, and Pakistan may help transfer knowledge, improve production quality, and create export-oriented light industry enterprises. The liberated territories may also provide new opportunities for the development of light manufacturing, local employment, and regional export capacity.

The chemical and metallurgical industries have significant potential for export diversification. The chemical and petrochemical sectors can contribute more strongly to non-oil exports if additional production chains are developed and more advanced processing facilities are established. High-technology-based production facilities are necessary to move beyond basic or semi-processed outputs. Similarly, the metallurgical sector requires modernization, stronger competition, and cluster-based development. The export of raw or low-value products should be gradually replaced by higher value-added production based on advanced processing and stronger industrial organization. These sectoral priorities are consistent with recent studies that identify agriculture, chemicals, and metallurgy as key areas for Azerbaijan's non-oil export development (Mekhraliyeva & Mamedov, 2021).

Reconstruction, smart infrastructure, renewable energy projects, agro-industrial development, logistics networks, and new transport links can create new sources of non-oil export potential. However, these territories should not be treated only as reconstruction zones. They should be developed as production-oriented economic spaces with clear sectoral priorities. Agro-processing, renewable energy, construction materials, logistics services, food production, and selected light manufacturing activities may provide realistic opportunities for export-oriented development.

The Alat Free Economic Zone, the Middle Corridor, and the Zangazur transport corridor also offer important strategic opportunities. Their effectiveness will depend on whether they are connected to domestic productive capacity. If these mechanisms remain limited to transit and logistics functions, their contribution to export diversification will be restricted. If they are integrated with industrial clusters, processing activities, export-oriented manufacturing, and foreign investment, they can become powerful instruments of economic transformation.

Overall, Azerbaijan needs a more coherent export diversification strategy based on innovation, industrial clusters, import substitution, green energy, targeted state support, and export-oriented manufacturing. The country has already created many of the necessary institutional and infrastructural foundations. The next stage should focus on effectiveness, coordination, and measurable outcomes. Export diversification in a resource-rich economy is a long-term structural process. For Azerbaijan, the main priority is to transform existing policy mechanisms into competitive non-oil exports, higher value-added production, and sustainable trade competitiveness. This priority is consistent with recent Azerbaijan-focused research emphasizing the need for stronger public-private partnerships, specialized export finance, and more effective non-mineral investment to overcome persistent export concentration (Das et al., 2022; Huseynov et al., 2023; Najafzade, 2025).

Credit Authorship Contribution Statement

Aliyev, S. T.: conceptualisation, methodology, formal analysis, writing - original draft, supervision. Shakaraliev, Z.: literature review, data interpretation, writing - review and editing. Babaeva Shapiulakhovna, Z.: validation, data interpretation, writing - review and editing. All authors approved the final version of the manuscript.

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Ethical Approval Statement

Not applicable. This study uses publicly available secondary statistical data and does not involve human participants or identifiable personal data.

Data Availability Statement

The data supporting this study are publicly available from the State Statistical Committee of the Republic of Azerbaijan and the Central Bank of the Republic of Azerbaijan. Source URLs are indicated in the tables and figures.

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