




# “Financial development and non-resource economic growth: Empirical evidence from Azerbaijan”

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<b>ARTICLE INFO</b>	İlgar Seyfullayev (2023). Financial development and non-resource economic growth: Empirical evidence from Azerbaijan. <i>Problems and Perspectives in Management</i> , 21(4), 253-263. doi: <a href="https://doi.org/10.21511/ppm.21(4).2023.20">10.21511/ppm.21(4).2023.20</a>
<b>DOI</b>	<a href="http://dx.doi.org/10.21511/ppm.21(4).2023.20">http://dx.doi.org/10.21511/ppm.21(4).2023.20</a>
<b>RELEASED ON</b>	Wednesday, 01 November 2023
<b>RECEIVED ON</b>	Tuesday, 11 April 2023
<b>ACCEPTED ON</b>	Thursday, 05 October 2023
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<b>JOURNAL</b>	"Problems and Perspectives in Management"
<b>ISSN PRINT</b>	1727-7051
<b>ISSN ONLINE</b>	1810-5467
<b>PUBLISHER</b>	LLC “Consulting Publishing Company “Business Perspectives”
<b>FOUNDER</b>	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

**50**



NUMBER OF FIGURES

**3**



NUMBER OF TABLES

**6**

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**BUSINESS PERSPECTIVES**



LLC "CPC "Business Perspectives"  
Hryhorii Skovoroda lane, 10,  
Sumy, 40022, Ukraine  
[www.businessperspectives.org](http://www.businessperspectives.org)

**Received on:** 11<sup>th</sup> of April, 2023

**Accepted on:** 5<sup>th</sup> of October, 2023

**Published on:** 1<sup>st</sup> of November, 2023

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# FINANCIAL DEVELOPMENT AND NON-RESOURCE ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM AZERBAIJAN

## Abstract

Most research on financial development and non-resource economic growth presents a wide range and, in some cases, even conflicting results. Evidence from emerging and resource-rich countries may enrich the scientific discourse with new empirical evidence. Therefore, the study aims to assess the mutual impact of financial development and non-resource economic growth in Azerbaijan. The growth rate of real non-oil gross domestic product (GDP), the share of loans in non-oil GDP, and the share of the broad money in GDP were taken as variables for the model. Monthly variable data from 2005–2022 were processed using the unrestricted vector autoregression model. The study's results did not provide evidence for long-run causality between the finance sector and non-oil growth. But there are short-run and unidirectional causal relationships – from loans to non-oil growth and from broad money to loans. The results also showed that the increase in loans does not support broad money growth. Policymakers are encouraged to increase incentives for lending to the non-oil sector. Supporting money supply growth through increased deposits and non-cash money could also positively impact non-oil growth through loan channels. The development of the securities market could also open up additional financing opportunities for entrepreneurs in the non-oil sector.

## Keywords

loans, broad money, monetary policy, economic growth

## JEL Classification

G28, O42, O47

## INTRODUCTION

The modern structure of economic life and the processes taking place in the economies of all countries of the world without exception requires a clear understanding and rethinking of the mechanisms of interaction between the financial and real sectors of the economy, as well as their influence on the actual state of affairs of economic entities.

The processes of globalization and the emergence of digital money have radically changed the capabilities of the financial sector and, thus, to this day, fuel scientific disputes about the mutual influence of the real and financial sectors. A review of numerous empirical studies shows that these relationships are not general, and there are scientific hypotheses that differ from each other. The quality of institutions, the abundance of natural resources, the diversification of exports, income inequality, and other factors strongly influence the real and financial sectors relationship.

Undoubtedly, the study of the influence of these factors can provide new scientific ideas about the dialectics of financial and real sector developments. In many emerging economies, market and government institutions are not yet able to mitigate market and regulatory failures.



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### Conflict of interest statement:

Author(s) reported no conflict of interest

In addition, in some emerging countries, under the influence of external and internal factors, such structures of the economy have been formed that leave their distinctive imprints on economic growth and financial development. In this context, the effect of existing structures of exports and imports on the relationship between the financial and real sectors is also of scientific interest. In recent years, the economic literature has increasingly discussed the impact of income inequality on these relationships.

The existence of rich natural resources creates a strong incentive for the easy export of natural raw materials, which leads to a large imbalance in both foreign trade and the structure of the economy. These processes are also reflected in the institutional foundations formation of the countries' economic systems. Thus, completely different conditions are being formed, where the financial and real sector relations acquire other properties. The questions arise: What is the relationship between financial development and economic growth in resource-rich developing countries? How are they different from other economies?

Staged implementation of socio-economic reforms in Azerbaijan demonstrates effective results, allowing to attract significant foreign investments in critical sectors of the economy. At the same time, the regulatory function of the state in determining the direction of economic development is kept at a significant level, the purpose of which is to ensure the stability of the economic and financial systems and the accumulation of resources to ensure investment and social programs. The economy of Azerbaijan, where 90-95% of exports are made up of crude oil and natural gas (CBAR, 2023), is a suitable object of study to find answers to the questions raised.

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## 1. LITERATURE REVIEW

Most research has been conducted to determine the existence and nature of the finance-growth relationship. Researchers have studied this relationship using different statistical methods, economic indicators, and data from many countries.

The mutual impact of financial and real sectors has been the object of study both theoretically and empirically. To explain this phenomenon, two models of this relationship direction were introduced. The followers of Schumpeter (1934) support a supply-leading model based on the proposition that financial markets are critical to economic growth by providing for the mobility of financial resources for entrepreneurial and innovative investment. Mishkin and Serletis (2011) also stated the role of financial markets in improving economic efficiency through the productive allocation of funds. Viewing a well-functioning financial sector as one of the growth drivers, they argue that poorly functioning financial systems are the cause of low growth in many countries.

Like in theoretical studies, conflicting results were also obtained through empirical investigations. Eryilmaz et al. (2015) found a causal relation-

ship directed from the finance sector to economic growth in 23 OECD countries. Stigling (2019), based on data of G7 countries from 1996 to 2013, also found that financial development variables such as interest rates, overall investment growth, and stock market capitalization were positively related to economic growth. Erataş-Sönmez and Sağlam (2019) studied the relationship in developing countries and found causality from finance to growth in the long run, supporting the supply-leading model.

In Azerbaijan, Mukhtarov et al. (2019) examined the bank loans and the exchange rate impact on the non-oil GDP over the period 2005–2019. The results showed that the influence of financial variables on GDP is long-run, positive, and statistically significant. Guru and Yadav (2019), researching BRICS countries, found that the growth of the banking sector and stock market indicators stimulate economic growth. However, proponents of the supply-leading model suggest that economic growth by stimulating the demand for financial resources (demand-following model) will lead to financial development (Robinson, 1952).

Karabiyik and Tashkin (2016), based on data from Turkey and BRICS countries and using the

Dimutrescu-Hurlin panel causality test, show that in these countries, there is a significant impact of economic growth on the banking sector's development. These results confirm the existence of a demand-following model in these countries. In addition to the mentioned researchers, Puatwoe and Piabuo (2017), Bist and Bista (2018), Hasan (2018), Sumarni (2019), Bogari (2019), Nguyen et al. (2022), Cheng-Sze et al. (2021), Ekanayake and Tawer (2021), Abbas et al. (2022), and Bibi and Sumaira (2022) revealed a positive long and short run relationship between finance development and growth.

Mukhtarov (2020), studying the bank loans and GDP growth in Azerbaijan using the Toda-Yamamoto test on annual data from 1992 to 2018, found a bidirectional causality between loans and economic growth.

There are no less compelling arguments confirming completely opposite conclusions in the economic literature. Many researchers detected a negative and insignificant finance-growth relationship. Samargandi et al. (2015) studied the matter using data from 52 middle-income countries covering 1980–2008 and found the finance-growth relationship to be U-shaped in the long run. This result suggests that excess finance has a negative impact on economic growth. According to this study, the short-run relationship is insignificant, too.

Eugen (2016) assessed the impact of the financial sector on economic growth in Albania based on the correlation between lending and growth. Data from 1994 to 2015 were analyzed using time series regression. The results found that financial development has a negative impact on economic growth. Wen et al. (2022) examined data from 120 countries from 1997 to 2017 and found a negative impact of the financial sector on economic growth.

Some studies argue that increasing financial depth is detrimental to growth when credit to the private sector exceeds 100% of GDP (Arcand et al., 2015). Matei (2020) studied 11 developing European countries over the period 1995–2016 and revealed that the positive impact of the financial sector on economic growth is short-term. After a certain threshold, this impact becomes negative.

Selvasundaram et al. (2022) reached a similar result by applying MG-ARDL and CD-ARDL (MG) models with datasets of BRICS countries. The conclusion is that excessive private credit supply is damaging and slowing down economic growth.

Along with these studies, there are also studies that have found arguments about the absence of a relationship between financial development and economic growth. Effiong (2018) and Musakwa and Odhiambo (2022) did not find any significant causality in the finance-growth relationship. Okuyan (2022), using the Toda Yamamoto test, processed data for 19 developing countries and found that in four of them, economic growth leads to financial development. In the other four, an inverse positive relationship was found. In the remaining 11 countries, a causal relationship between finance development and growth was not found.

Many researchers have also studied the relationship between finance and growth in oil-rich countries. Alghfais (2016) targeted the relationship between the financial and non-oil sectors in Saudi Arabia from 1985 to 2015. They argued that financial development has a positive and significant impact on non-oil growth.

Ogbonna et al. (2020) conducted similar research on another oil-rich country, Nigeria, on the data from 1981 to 2015. The study showed that the financial sector growth has an insignificant negative impact on the oil sector. Along with this, the financial sector has a positive and significant impact on the non-oil sector.

Fundamental differences in the results of empirical studies confirm that the nature of the relationship between financial development and economic growth is not the same and that the economic characteristics of each country leave their mark on these relationships. The analysis of these studies asserts the hypothesis that the content and form of the finance-growth relationship largely depend on the country's development level, institutions, inequality, quality of public administration, etc.

Azerbaijan, with its unique economic structure and emerging institutions, differs from the above countries. Numerous researchers have studied various problems in the Azerbaijani economy and

proposed approaches to its solution. Aliyev and Mikayilov (2016) and Aliyev et al. (2016) examined the fiscal policy and government spending impact on economic growth. Mammadov and Ahmadov (2021) assessed the contribution of financial development to the country's overall economic growth. Humbatova et al. (2019) analyzed the relationship between oil prices, inflation, exchange rate, investment and growth. Mammadli (2022) drew attention to the environmental dimension of economic development. Seyfullali (2022) looked for relationships between economic growth, inflation, interest rate, and non-performing loans. Seyfullayev (2020, 2022) assessed the impact of protectionism and trade openness on non-oil economic growth. Niftiyev (2020, 2021) examined the symptoms and impact of Dutch disease on economy. Niftiyev and Namazova (2020) discussed issues of economic cyclicity. Another study analyzed the impact of financial development on the manufacturing sector of Azerbaijan (Seyfullayev & Seyfullali, 2023). However, the relationship between financial development and non-oil economic growth is not sufficiently considered in these studies.

Research on the relationship between financial development and non-resource economic growth in resource-rich emerging countries can provide new arguments to explain the content and form of the relationship between these sectors. The relationship between the real and financial sectors of the economy has been the object of this study.

## 2. METHODS

Instead of the growth in the whole economy, this study focuses on non-oil sector growth. The purpose is to minimize the effects of global oil price fluctuations on the oil-dominant economy of Azerbaijan and examine the relationship more accurately. The real non-oil sector GDP growth rate measures non-oil sector growth.

A review of the literature shows that an extensive range of indicators assesses the level of financial development. These indicators can be conditionally combined into two groups: indicators of the securities market and indicators of the monetary sector. The low level of the securities market development in Azerbaijan does not allow for the use of their in-

dicators in this study. However, the banking sector in Azerbaijan is the main source of business financing. Along with this, an important place is occupied by the tools of financial regulation.

That is why, as proxies of financial development, the share of loans given by financial intermediaries to the non-oil sector in non-oil GDP and the share of broad money (M3) aggregate to GDP are used (Table 1). The monthly data from 2005 to 2022 for these indicators were derived from the statistical sources of the Central Bank of the Republic of Azerbaijan (CBAR, 2023).

**Table 1.** Variables of the model

Designation	Variables	Definition
GDPG	The real non-oil GDP growth	The ratio of real non-oil GDP of the current and previous month
SL	The share of loans	The share of loans (given by financial intermediaries to the non-oil sector) in non-oil GDP
SM3	The share of broad money (M3)	The share of M3 in GDP

An unrestricted VAR model is applied to assess the nature of the finance-growth relationship. The application of the unrestricted VAR model is widely covered by Simkins (1995) and Polito and Wickenc (2012).

The first stage in applying the method is to determine the stationary of the time series. Augmented Dickey-Fuller test is involved in this issue (Dickey & Fuller, 1981). Secondly, it required lag selection, which is done using the LR test, Final Forecast Error (FPE), Akaike, Schwartz, and Hannan-Quinn information criteria. Johansen's test is used to analyze cointegration relationships between variables (Johansen, 1988). A VAR model is compiled depending on the result of the Johansen cointegration test.

Unrestricted VAR equation is as follows (Engle & Granger, 1987):

$$\begin{aligned} \Delta y_t &= \beta_1 y_{t-1} + \beta_2 x_{t-1} + c_1 + \varepsilon_{1t}, \Delta x_t = \\ &= \beta_3 y_{t-1} + \beta_4 x_{t-1} + \gamma \Delta y_t + c_2 + \varepsilon_{2t}, \end{aligned} \quad (1)$$

where  $y_t$  and  $x_t$  are the original data sets,  $c$  – constant,  $\varepsilon_{1t}$  and  $\varepsilon_{2t}$  are vector error term of equations.

The quality of the model is measured by indicators such as the coefficient of determination ( $R^2$ ), Durbin-Watson stat, and by tests for autocorrelation (VAR Residual Serial Correlation LM Tests) and normality of distribution (Cholesky of covariance) in the residuals of the model.

### 3. RESULTS

The ADF test result showed that all three variables at the primary level are not stationary, but at the first difference, they become stationary at the 1% level of statistical significance (Table 2).

The lag length is determined to be 2 by the majority of the given criteria (Table 3).

The results obtained suggest appropriate prerequisites for moving to the next stage of the analysis, where the causality characteristics of the finance-non-oil growth relationship are determined. The Johansen test was used to check the existence of long-run impact (Table 4).

The data obtained from the Johansen test show no cointegration between variables. This result con-

firms that the share of loans and M3 in GDP and non-oil economic growth do not influence each other in the long run. This is why short-run relationships between variables are tested using the Unrestricted VAR model by the following equations:

$$GDP = \beta_1 GDP(-1) + \beta_2 GDP(-2) + \beta_3 SL(-1) + \beta_4 SL(-2) + \beta_5 SM3(-1) + \beta_6 SM3(-2) + \beta_7, \quad (2)$$

$$R^2 = 0.88, DW\ stat = 2.01,$$

$$SL = \beta_8 GDP(-1) + \beta_9 GDP(-2) + \beta_{10} SL(-1) + \beta_{11} SL(-2) + \beta_{12} SM3(-1) + \beta_{13} SM3(-2) + \beta_{14}, \quad (3)$$

$$R^2 = 0.97, DW\ stat = 1.99,$$

$$SM3 = \beta_{15} GDP(-1) + \beta_{16} GDP(-2) + \beta_{17} SL(-1) + \beta_{18} SL(-2) + \beta_{19} SM3(-1) + \beta_{20} SM3(-2) + \beta_{21}, \quad (4)$$

$$R^2 = 0.94, DW\ stat = 2.02.$$

The Wald test (Engle, 1984) in the VAR environment is used for the assumption of this linkage (Table 5).

**Table 2.** ADF unit root test results

Indicators	GDPG		SL		SM3	
	level	1st difference	level	1st difference	level	1st difference
Trend	0.08	0.00	0.42	0.00	0.29	0.00
Trend and intercept	0.19	0.00	0.88	0.00	0.13	0.00
None	0.66	0.00	0.61	0.00	0.78	0.00
	none	I(1)*	none	I(1)*	none	I(1)*

Note: \* significance level at 1%.

**Table 3.** Lag selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-33.13685		0.000284	0.347470	0.395607	0.366934
1	873.5780	1778.556	5.07e-08	-8.284404	-8.091853*	-8.206546*
2	883.5291	19.23245*	5.02e-08*	-8.293549*	-7.956586	-8.157299

Note: \* significance level at 1%.

**Table 4.** Johansen cointegration test results

Cointegration equations	Trace test			
	Eigenvalue	TS	0.05 CV	Prob.
None	0.082	26.81	29.89	0.1063
At most 1	0.029	8.48	15.5	0.4153
At most 2	0.010	2.18	3.84	0.1401



**Table 5.** Wald tests results

Impact	Test Statistic	Value	df	Prob.	Short-run causality
From SL to GDPG	Chi-square	6.542	2	0.0380	yes
From GDPG to SL	Chi-square	5.172	2	0.0753	no
From SM3 to GDPG	Chi-square	2.456	2	0.2928	no
From GDPG to SM3	Chi-square	0.967	2	0.6165	no
From SM3 to SL	Chi-square	6.513	2	0.0385	yes
From SL to SM3	Chi-square	0.967	2	0.6165	no

In each equation, the equality of the coefficients of each independent variable to zero is checked using the Wald criterion. If the hypothesis about the equality of the coefficients of independent variables to zero is rejected (with  $p$ -value  $\leq 0.05$ ), then one can talk about the presence of short-run causality.

VAR Residual Serial Correlation LM Test was used to detect the autocorrelation in the residuals of the model (Table 6).

The results of VAR residual normality tests also indicate that the residual of the model is multivariate normal. In addition, the results of the Cholesky covariance test showed normal distribution in the model residuals. The results of the quality tests confirm the reliability of the obtained evidence.

The results provide evidence for the following arguments:

- Lending growth has a statistically significant and positive effect on real non-oil GDP in the short run, while real non-oil GDP growth does not cause lending growth (at the 5% statistical significance level).
- The impact between broad money and real non-oil GDP is not significant.
- The broad money growth supports the growth of lending. The positive short-run impact from

loans to non-oil GDP growth suggests that the broad money growth may have a positive effect on non-oil growth by lending channels.

- Lending growth does not increase the broad money, which is good news in terms of inflation pressure.

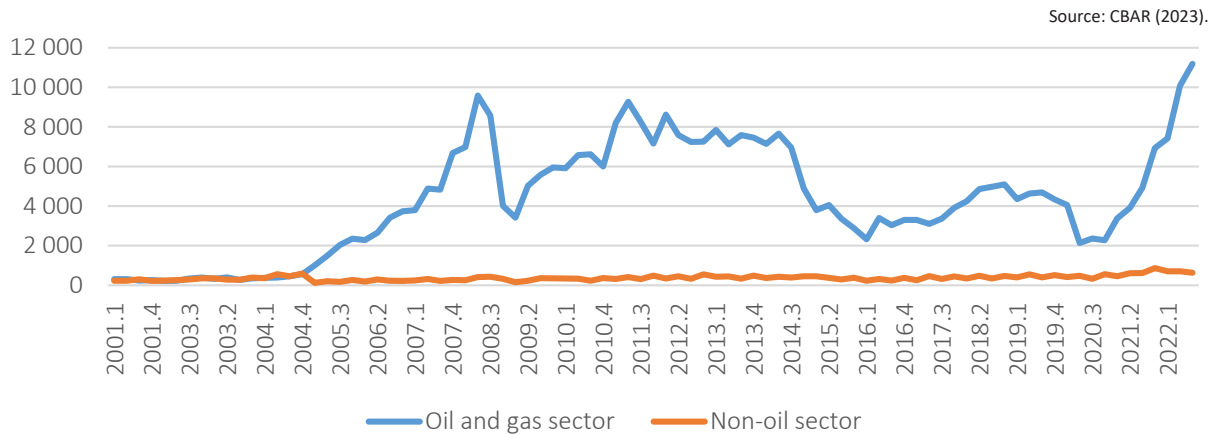
## 4. DISCUSSION

The results point to a short-run positive relationship between the share of loans and real non-oil GDP growth. The positive impact of financial development on GDP growth has also been found by Bist and Bista (2018), Guru and Yadav (2019), Stiglingh (2019), Bibi and Sumaira (2022), and specifically on the non-oil sector growth by Alghfais (2016) and Ogbonna et al. (2020). Generally, the result is in accordance with the supply-leading theory. While many other studies support this phenomenon, it conflicts with the findings of Effiong (2018), Musakwa and Odhiambo (2022), and Wen et al. (2022). The causality from growth to finance is found to be insignificant, which conflicts with the demand-following theory. At the same time, the short-run impact between real GDP growth and broad money was not found.

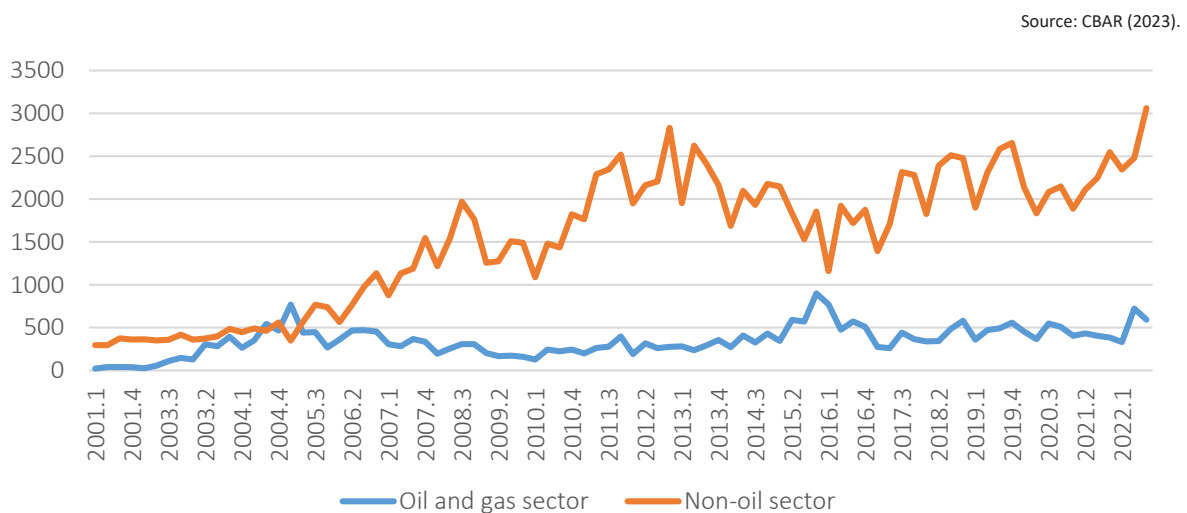
The lack of relationships between variables in the long run contradicts the results obtained by Mammadov and Ahmadov (2021), Sumarni

**Table 6.** LM tests results

No serial correlation at lag h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	9.329810	9	0.4074	1.039076	(9, 491.8)	0.4074
2	8.267088	9	0.5075	0.919729	(9, 491.8)	0.5075
No serial correlation at lags 1 to h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	9.329810	9	0.4074	1.039076	(9, 491.8)	0.4074
2	12.81192	18	0.8026	0.709735	(18, 563.3)	0.8027



**Figure 1.** Quarterly export of Azerbaijan (in million US dollars)



**Figure 2.** Quarterly import of Azerbaijan (in million US dollars)

(2019), Erataş-Sönmez and Sağlam (2019), and Cheng-Sze et al. (2021). While it is generally accepted that the financial system stimulates economic activity through a more efficient allocation of resources, the lack of a long-run link between the finance sector and non-oil growth in Azerbaijan may be the result of inadequate financial structures. This result is also consistent with Mishkin and Serletis' (2011) conclusions. The study calls on regulators to take action to support financial development by improving financial institutions and their influence on non-oil growth.

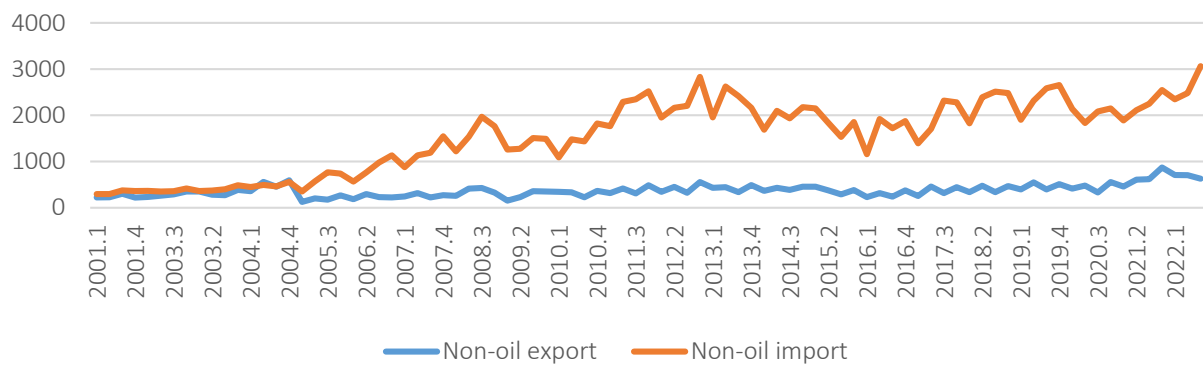
Issues of non-oil growth have been on the agenda of the Azerbaijani government since the first years of gaining state independence. For this purpose, numerous programs have been developed and implemented, and various support

measures have been taken. However, the desired level of non-oil growth has not yet been achieved. Figure 1 shows the structure of Azerbaijan's quarterly exports for the period 2000–2022.

Figure 1 clearly shows the beginning of the discrepancy between the oil and non-oil export. From the end of 2004 and the beginning of 2005, oil prices began to skyrocket, and the world witnessed another oil boom. For 23 years, quarterly volumes of non-oil exports have grown at a meager pace and did not exceed \$700 million.

To complete the picture, Figure 2 shows the dynamics of the import structure. Here, reverse processes are observed. Since the beginning of 2001, non-oil sector imports have grown 5-6 times and are many times higher than oil imports.





**Figure 3.** Quarterly non-oil export and import of Azerbaijan (in million US dollars)

Figure 3 compares quarterly non-oil exports and imports in Azerbaijan. Since 2005, the deficit of the non-oil foreign trade balance has been growing, and the exception to this trend is the periods of crises of 2008 and 2014 when oil prices in world markets fell sharply.

These facts point to the presence of signs of Dutch disease and structural problems in the economy. The significant dependence of exports on the oil price level creates huge risks for macroeconomic stability and thus encourages researchers and politicians to look for ways to diversify exports and develop the non-oil sector.

## CONCLUSION

The effectiveness of economic processes at the national level depends on the quality of interaction between the financial and real sectors of the economy since the financial sector can become both an engine and ballast for economic processes. The object of the study is to determine the relationship between the real and financial sectors of the economy. Based on the results, the Johansen Cointegration test results confirm that the financial development of Azerbaijan has not yet been able to turn into a driver of the non-oil sector in long-run, and the non-oil sector, in turn, cannot support the financial sector. Based on these findings, it can be confirmed that in oil-rich Azerbaijan, theoretical postulates about the primacy of the real or financial sectors, in the long run, are not justified. This situation may be the result of a particular economic structure and the imperfection of market and financial institutions inherent in emerging countries.

But in the short run, the opposite results were found. The results also show that in a resource-rich emerging country, non-resource economic growth responds differently to individual components of financial development.

The VAR model data show that growth in non-oil sector lending has a positive and significant impact on non-oil growth. This result confirms the “leading supply” postulate. In turn, non-oil growth has a positive but insignificant impact on lending. This result suggests that in the short run, there is a bidirectional causal relationship between finance and the non-oil sectors.

The calculations performed did not provide evidence of mutual influences existence between the broad money and the non-oil GDP growth. This indicates that the monetary instruments of regulation have not yet reached the desired adequate level. However, the existence of a statistically significant impact from the broad money to the non-oil sector lending suggests that a policy to increase deposits and cashless payments can be effective in that it supports lending and thus promotes non-oil economic growth. In addition, the lending growth does not cause the growth of the broad money, which reduces the likelihood of rising inflation.

The obtained results show that the development of the finance sector is an essential factor of non-natural sectors' growth and lending is a more effective tool for supporting economic growth than broad money. Studies of the financial sector's impact on various non-oil branches could provide more detailed conclusions for improving economic decision-making.

## AUTHOR CONTRIBUTIONS

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 Funding acquisition: Ilgar Seyfullayev.  
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 Writing – original draft: Ilgar Seyfullayev.  
 Writing – review & editing: Ilgar Seyfullayev.

## ACKNOWLEDGMENTS

Acknowledgments are expressed to all the scientists whose works have become a theoretical and methodological foundation for the study. It is also necessary to note the Central Bank of the Republic of Azerbaijan, which provides open access to the use of an extensive information base.

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