

THE IMPACT OF FINANCIAL DEVELOPMENT ON THE MANUFACTURING INDUSTRY IN RESOURCE-RICH COUNTRIES: EMPIRICAL EVIDENCE FROM AZERBAIJAN

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ABSTRACT

The study is devoted to assessing the causal relationship between financial development and economic growth in the manufacturing sector of Azerbaijan, a country rich in oil and gas resources. The study covers quarterly data from 2005-2021. The Johansen co-integration test and the Toda-Yamamoto test are used to analyze temporal and causal characteristics between indicators. The results showed that there is no co-integration between financial development and growth in the long run. Along with this, no evidence was found indicating the presence of a causal relationship between variables in the short run. The results show that increased credit availability does not necessarily positively impact productivity and capital growth in the manufacturing sector. At the same time, the growth of loans contributes more to the growth of imports than to the growth of domestic production. The hypothesis about the negative impact of the "resource curse" on financial development is confirmed by the weak level of financial market development in Azerbaijan, which makes it difficult to assess the securities market's impact on manufacturing sector growth. Research on the institutional aspects of financial regulation and finding ways to increase the relative attractiveness of the manufacturing sectors could provide more detailed recommendations to improve the effectiveness of financial instruments.

Keywords: financial development; economic regulation; manufacturing industry

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INTRODUCTION

The scientific debates surrounding the mutual influence of the financial sector and economic growth can be summarized in two groups:

- The real sector creates demand for financial resources, and the financial sector develops "the demand-following," satisfying the demands of the real sector (Robinson, 1952, Lukas, 1988);
- The financial sector has reached such a level that it can have an important impact

("supply leading") on the real sector's growth (Schumpeter, 1934; Hicks, 1969; Levine, 1997).

As early as the beginning of the last century, Schumpeter found that banks play an important role in generating the necessary capital for creating, developing, and commercializing innovations. (Schumpeter, 1934).

Financial institutions support economic growth by accumulating capital and technological innovation channels (Levine, 1997).

Many empirical studies support the positive impact of financial development on growth; however, the degree and time characteristics (short or long-term) of such an impact differ depending on the selected indicators, research methods, the period of data coverage, and other factors. Market uncertainty increases the cost of acquiring the information needed to make decisions. Along with this, information asymmetry appears due to the uneven distribution of information availability among economic agents, leading to a disruption of the market mechanism and increased risks. As such, transaction costs increase due to the impossibility of considering all unforeseen circumstances in the contracts concluded (Khan & Senhadji, 2020).

Following the above facts, the level of trust and information asymmetry between economic agents predetermines the importance of the financial sector's role in economic growth.

Today's economic growth in Azerbaijan is primarily due to income from selling raw materials (oil and gas). The country's non-oil sector is growing mainly because of such industries as trade, transport, communications, construction, and services. Unfortunately, the country's manufacturing sector is not among these industries, which has the potential to increase exports and import substitution, support the development of science and technology, and evade comparative advantages and competitiveness in foreign trade.

Azerbaijan has taken advantage of various government programs and regulatory measures to develop the economy's manufacturing sector. These state attempts continue to this day. Various studies are devoted to studying the reaction of local enterprises to regulatory measures (Mammadli, 2022; Mammadov and Ahmadov, 2021; Seyfullayev, 2020; Seyfullayev, 2022), but the impact of the country's financial development on the manufacturing sector's growth in resource-rich countries, including Azerbaijan, has not yet been sufficiently studied. In addition, the effectiveness of financial instruments largely depends on the economy's structure, the quality of institutions, and regulation. As a result, the study's goal is to investigate the impact of financial developments on the growth of Azerbaijan's manufacturing industries.

Deterioration in the tradable products

industries (including manufacturing) is known to be one of the signs of the "Dutch disease," which is common among countries rich in natural resources. Studying the application results of financial regulatory instruments in such countries may contribute to adapting theoretical postulates to different situations.

LITERATURE REVIEW

The impact of financial development on economic growth is considered in several directions in the economic literature. Early studies also identified directions for saving toward productive investment. The financial sector facilitates exchange and supports demand by offering new and efficient payment schemes. The financial sector also creates risk diversification opportunities, increasing entrepreneurs' motivation. On the other hand, the digitalization of financial services turns banks into a rich source of marketing information and thus creates great opportunities to reduce uncertainties and risks (Romer, 1986; Lukas, 1988).

In countries with high and middle incomes, the financial sector's influence on economic growth occurs when productivity growth is supported; in low-income countries, this process is ensured by supporting capital growth (Rioja & Valev, 2004a, b).

In studies devoted to the influence of financial development on growth, general or non-resource GDP is taken as the dependent variable. The effectiveness of loans in both sectors, however, is known to differ as a result of the difference in the internal and external environments.

Suna Korkmaz (2015) investigated the relationship between the share of bank loans in GDP, the annual growth rate of GDP, and inflation in 10 European countries, determining that bank loans support economic growth without affecting inflation.

In a study carried out in India on the basis of the analysis of the relationship between the index of industrial production, bank loans and deposits, and the securities market, as well as inflation and the ratio of exports to imports (which were used as control variables), stock markets and bank loans, both in the short and long run, were proven to have a positive effect on economic growth (Tripathy, 2019).

In another study, based on the use of such indicators as real GDP, the share of credits issued to the private sector in GDP, the share of fixed capital savings in GDP, trade openness, and inflation (CPI), a long-run relationship between credits issued to the private sector and growth was found in middle-income countries. The positive influence of credits on economic growth is also observed in countries with low income, but these conclusions do not justify themselves in countries with a weak legal system (Bist, 2018).

The mutual support of the financial sector and growth is also confirmed in studies conducted in Sub-Saharan Africa (Aluko et al., 2020). This relationship, however, is closely tied to the parallel development of the financial and real sectors, wherein excessive crediting of risky investments (supporting inflation) and unrestrained consumption create serious threats to further economic growth (İbrahim and Alagidede, 2018).

Walle (2014) proved that private credits and liquid liabilities lead to long-term economic growth. Ajaravci (2009) argued that causal relationships between local credits, liquid liabilities, and growth depend on the degree of financial development.

The growth of the financial development index in Nigeria has a positive effect on the non-oil sector, but its impact on the oil sector is negative (Ogbonna et al., 2020). In this country, the development of the financial sector causes economic growth (Asaley et al., 2018). Another study conducted in Nigeria proved that there is a negative relationship between financial development and growth (Elijah & Hamza, 2019).

Loayza and Ranciere (2006) showed that the development of the financial sector negatively affects growth in the short-run, but in the long-run, this influence changes to a positive one.

Durusu-Ciftchi and co-authors determined that there are connections between credits, stock markets, and GDP per capita. At the same time, credits affect growth more than stock markets (Durusu-Ciftçi et al., 2017).

Calderon and Liu (2003), using indicators such as the share of M2 and private credits in GDP, determined that financial development and economic growth sustain each other in developed and developing countries. In their opinion the influence of the real sector on the financial sector is greater than the influence in

the opposite direction in developed countries. Causal connections from the financial sector to economic growth are stronger in developing countries.

Hasan, Sanchez, and Yu (2011) used such indicators as the share of local bank loans in GDP, the share of loans issued by local banks to the private sector in GDP, the share of M3 in GDP, and the share of total savings in GDP to assess the level of financial development. They determined that there is a causal relationship in the short run in highly developed regions. In the developing countries of Sub-Saharan Africa, Eastern Asia, and the Pacific region, economic growth creates a large demand for the financial sector, driving its development (*demand following*).

Valickova and her co-authors summarized the results of such studies and came to the conclusion that in underdeveloped countries, stock markets better support economic growth than the development of the banking sector (Valickova, 2015). The findings from India show that financial liberalization, particularly easier access to banking products, positively affects total factor productivity in private manufacturing firms (Xu & Pal, 2022). Liu et al (2020) studied data from 62 countries and concluded that the development of financial and business services positively affects those manufacturing companies that actively use these services.

Based on these results, the leading role can be argued to be the real sector in developed countries as well as underdeveloped countries, but the financial sector prevails in developing countries. The quality institutions found in developed countries bring the real sector to a decent level, and the financial sector develops following all the new needs of the real sector (*demand following*). The objective weakness of the real sector can explain the leading position of the real sector in underdeveloped countries. The financial sector has a leading position (supply-leading) only in developing countries with underdeveloped institutions, and its improvement is at the forefront of the expansion of the real sector.

There are also arguments in the economic literature in the opposite direction. In these studies, financial development is proven not to be beneficial for economic growth, arguing that such a relationship between finance and growth does not depend on the level of national income

(Chih-Yang et al., 2021).

The financial development components that influence the service and manufacturing sectors' growth are also interesting areas of research. One such study, based on data from 108 countries, found that the service sector responds better to the depth, efficiency, and accessibility of financial markets. The manufacturing sector improves with financial institutions' development and the financial market's depth and access (Daway-Ducanes & Gochoco-Bautista, 2021). These results confirm that different branches of the real sector react differently to financial impulses.

Using the example of China, Khan et al. (2020) proves that abundant natural resources negatively affect financial development. The growth of trade openness, increased technological innovation, and human capital development, however, alleviate this negativity to a great extent. Such results allow the complexities of regulatory decision-making to be better understood. An abundance of exportable resources under certain conditions turns into difficult barriers to developing technology and human capital. Tang et al. (2022) came up with similar results for ASEAN countries, finding that business support measures reduce the negative impact of natural resource abundance on financial development.

Research conducted on the agrarian, industrial, and service sectors of sub-Saharan countries showed that credit growth has a positive effect on the service and agrarian sectors but a negative impact on the industrial sector. Along with this, the authors claim that after surpassing a certain level, the influence of credit on the sectors completely changes to turnover (Ustarz & Fanta, 2021).

Another study conducted using the example of Ghana also proved the long-run and short-run negative relationships between financial development and growth (Ho & Lyke, 2020).

Caporale and co-authors claim that the support of economic growth by the financial and credit markets significantly decreases when financial depth is limited (Caporale et al., 2015).

In a study conducted in countries with an average income level, financial development's influence on economic growth was proven to be non-monotonic. This influence in the long term has the character of an inverted U, but in the

short run, these relationships are statistically insignificant. To assess the dependence of the relationship between financial development and growth on the level of income, the authors divided the sample into countries with upper middle income (UMIC) and lower middle income (LMIC). As a result, financial development in the UMIC countries was revealed to have a negative impact on growth in the long and short runs. However, these relationships are statistically insignificant in countries with incomes below the average level (Samargandi et al., 2014).

A study that examines the relationship between inequality and growth in the context of financial development shows that inequality limits growth at a low and medium level of financial development. Still, the impact of inequality on growth decreases at a high level of financial development (Madsen et al., 2018). Central bank independence (Rizvanoghlu & Nagac, 2018) and the financial stability of the banking system (Sobolieva-Tereshchenko & Zhukova, 2020) are also seen as factors influencing financial development and economic growth.

The given examples show that the nature of the relationship between financial development and economic growth changes depending on the level of economic development, the country's income, and the institution's quality. From this point of view, studying the influence of financial development on growth in the manufacturing sector in countries rich in natural resources is of particular scientific interest.

METHODOLOGY

In order to fully reflect the level of financial development, indicators must characterize the activities of all financial institutions, such as stock markets, banks, etc. In many developing countries, however, including Azerbaijan, stock markets are still in the formation stage, meaning that this study must be satisfied with the indicators of the credit markets. In countries with an underdeveloped financial sector, monetary aggregates M1 and M2 reflect the ability of banks to execute transactional operations. Still, they cannot fully characterize the ability of banks to reallocate monetary resources to the real sector. The weak development of stock markets limits the attractiveness of securities as a means of accumulation, and thus, the share of low-

productivity aggregates (M1 and M2) in GDP is growing. This is why M1 and M2 are not recommended as indicators of financial development (Khan & Senhadji, 2020). The monetary aggregate M3, which is taken as the liquid liabilities of banks, is considered a more appropriate indicator, but the inclusion of M2 in its composition reduces its ability to reflect the real situation in cases where M2 has a large share in M3. On the other hand, M3, which is used by the whole economy, is also not an attractive indicator for this study since it targets only a small part of the Azerbaijani economy—the manufacturing industry.

King and Levine (1993b) used indicators such as "the share of liquid liabilities of banks and non-bank credit institutions (M3) in GDP," "the ratio of bank loans to central bank loans," and "the share of loans issued to the private sector in GDP" to assess the financial system.

Other indicators used to assess financial development include local bank loans (Ho and Lyke, 2020), private loans (Jaquadish, 2018), market capitalization and private loans (Okunlola et al., 2020; Asaley et al., 2018), deposit bank liabilities (Fowowe, 2011; An et al., 2020), M3 – liquid liabilities (King & Levine, 1993a; Elijah & Hamza, 2019), and indices of financial institutions and financial markets (Ustarz & Fanta, 2021; Aluko et al., 2020), among others.

Because the object of the study is the manufacturing sector of Azerbaijan (share in GDP is 5-7%), the following indicators are used in the model:

- real GDP per worker (p) - the ratio of the GDP of the manufacturing sector (at 2005 prices) to the number of people employed in this industry
- share of physical capital in GDP (kp) - the ratio of physical capital to the nominal GDP of the sector
- share of loans in GDP (lp) - the ratio of loans issued to the manufacturing sector to the nominal GDP of the sector
- share of imports in GDP (ip) - the ratio of total imports to total nominal GDP

Azerbaijan is an exporter of such raw materials as oil and natural gas; however, the structure of its imports makes finding raw materials difficult. Except for some agricultural products, the country's imports consist mainly of goods from

its manufacturing enterprises. Imported industrial products competing with local goods have a strong influence on the country's manufacturing sector. Therefore, the share of imports in the country's GDP is also included as a control variable.

Quarterly data covers 2005–2021. The source of information is the official data of the Central Bank of the Azerbaijan Republic (CBAR, 2022) and the State Statistics Committee of the Azerbaijan Republic (SSCAR, 2022).

Vector autoregressive models are suitable for identifying causal and temporal patterns in the relationship between growth and finance. To apply such models, a number of operations are required on the variables' time series:

- checking the stationarity of time series and lag selection;
- If it turns out that the variables change in the same order, then co-integration tests are applied. As a result of such tests, the existence or absence of long-run relationships between variables is clarified;
- If there is co-integration between variables, then VECM is used to determine the causal nature of the relationship. If there is no co-integration, then the Toda-Yamamoto Test in the VAR environment determines causality in the short run.
- checking the quality of models (existence of autocorrelation and normality of distribution in the model's residuals)

The ADF test (Dickey and Fuller, 1979) determines variable stationarity. Co-integration relationships between variables were assessed using the Johansen Co-integration Test (Johansen & Juselius, 1990), and causal relationships were analyzed using the Toda-Yamamoto Test (Toda and Yamamoto, 1995; Okunlola et al., 2020; Dritsaki, 2017). VAR Residual Serial Correlation Lagrange Multiplier (LM) Tests and Inverse Roots of the AR Characteristic Polynomial were used to assess the adequacy of the model.

The Johansen Co-integration test is done using the trace and max-eigenvalue tests. If the trace and max-eigen statistic is less than its critical value (at 5% significance) and the p-value for each test is greater than 0.05, then the case of no co-integration between the variables can be confirmed.

In such a case, the causal nature of the relationships between model variables will be

studied using the Toda Yamamoto test, where each variable, in turn, becomes dependent, and the other variables play the role of independent variables. The decision criteria are chi-square and p-value. If the p-value of the independent variable is less than 0.05, then a change in this variable can be confirmed to cause a short-run change in the dependent variable. If the p-value of the independent variable is more than 0.05,

then the opposite hypothesis is confirmed - changes in this variable do not cause changes in the dependent variable.

DISCUSSION

The results of the ADF test show that all four variables at the primary level are not stationary, but the first derivatives of the variables are stationary.

Table 1. ADF unit root test results of the variables

	p		kp		lp		ip	
	level	1st difference	level	1st difference	level	1st difference	level	1st difference
Intercept	0.9762	0.0243	0.0006	0.0053	0.5886	0.0000	0.3959	0.0000
Trend and intercept	0.9473	0.0438	0.0053	0.0440	0.9189	0.0000	0.2112	0.0000
None	0.9401	0.0035	0.2329	0.0007	0.4186	0.0000	0.7087	0.0000
Result	none	I(1)**	none	I(1)**	none	I(1)*	none	I(1)*

Notes: The numbers in the table reflect p-value levels. * and ** denote statistical significance at the 1% and 5% levels, respectively.

Source: Authors' findings by Eviews

The lag was selected in the VAR environment. Based on the Hannan-Quinn information criterion and sequentially modified LR test statistic, lag=4 seemed to be optimal. Stationarity test results allow the use of the Johansen co-integration test.

Both, the trace and the max-eigenvalue test, indicate no co-integration between variables at 0.05. The absence of such links indicates that the regulatory measures taken by the state have not yet led to the expected results. Identifying the causal impact between variables could provide a more detailed picture. Therefore, the study involved the Toda-Yamamoto test. The results of the analysis are shown in Table 2.

Table 2. VAR Granger Causality/Block Exogeneity Wald Tests

Excluded	Chi-sq	df	Prob.
Dependent variable: P			
KP	2.838909	4	0.5851
LP	2.183796	4	0.7020
IP	0.946056	4	0.9179
Dependent variable: KP			
P	9.007709	4	0.0609
LP	8.168261	4	0.0856
IP	0.666448	4	0.9554
Dependent variable: LP			
P	1.051460	4	0.9019
KP	2.004875	4	0.7349
IP	1.139928	4	0.8879
Dependent variable: IP			
P	3.824748	4	0.4302
KP	1.679144	4	0.7945
LP	10.27896	4	0.0360

Source: Authors' findings by Eviews

The results of the VAR Residual Serial Correlation LM Tests show that there is no autocorrelation among the residuals of the model (lag=1, p-value=0.1594; lag 2, p-value=0.1594; lag=3, p-value=0.5637; lag 4, p-value=0.6450 and lag 5, p-value=0.3206). The lack of autocorrelation and the model's stability level (Figure 1) indicate that the quality of the model results is satisfying.

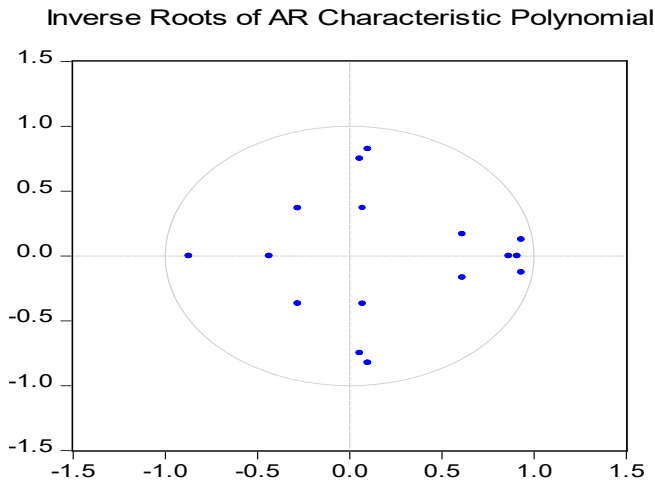


Figure 1: Dynamic stability of models (Source: Authors' finding by Eviews)

The Toda-Yamamoto test results show no causal relationship between the share of loans and GDP per worker in the manufacturing sector. This result is inconsistent with the theoretical findings of positive interaction between the financial sector and economic growth, showing that financial development and growth in the manufacturing sector of a country rich in natural resources is ambiguous (Korkmaz, 2015; Tripathy, 2019; Bist, 2018; Walle, 2014; Asaley et al., 2018; Durusu-Ciftçi et al., 2017; Kalderon and Liu, 2003; Hasan et al. I, 2011). Along with this, the results of the study are partially consistent with the thesis that the financial sector has no influence (and sometimes has a negative impact) on the real sector (Samargandi et al., 2014; Valickova, 2015; Ho & İyke, 2020; Ustarz & Fanta, 2021; Chih-Yang et al., 2021).

The results are also inconsistent with the findings that the financial sector positively affects the oil sector in Nigeria and Azerbaijan (Ogbonna et al., 2020; Mukhtarov et al., 2019). The absence of such positive linkages in the manufacturing sector suggests that the growth of credit in countries rich in natural resources creates a more attractive environment for the development of non-tradable sectors than for manufacturing industries.

In Azerbaijan, numerous financial support measures have been taken to develop the manufacturing industry. For example, after 2011, the Azerbaijani government made decisions to create several technoparks. These parks create all the infrastructural conditions for production activities, thereby relieving resident

entrepreneurs from the burden of investing in supporting infrastructure. In addition, residents of these parks are exempt from paying several types of taxes for 7 years (corporate and income tax, land and property tax, value-added tax on imports of equipment, components, and materials, etc.). The purpose of creating such parks was to diversify exports, increase the manufacturing share in the country's total exports, and strengthen domestic production for import substitution. However, significant changes in non-oil export have not yet been observed despite the long validity period of such benefits. The growth of the country's imports, the main part of which is consumer industrial products, suggests that local production has not yet acquired sufficient potential to influence the structure of imports.

CONCLUSION AND RECOMMENDATION

The results show that in Azerbaijan, there is no causal relationship between economic growth, physical capital, and loans in the manufacturing industry. There is also no evidence of such links between manufacturing loans and physical capital.

An interesting result is that manufacturing loans have a positive and statistically significant impact (p -value=0.036) on imports. The result obtained can be explained as follows: domestic enterprises used some of the loans to import goods for industrial purposes rather than capital expenditures, and the creation of new jobs supports the demand for imported consumer goods. This picture can be explained by the fact that the competitiveness of domestic industrial products has not yet reached the expected level.

These arguments suggest that the current credit policy does not support the growth of the country's manufacturing sector, and the bulk of loans issued are used to meet the demand of enterprises for working capital.

Thus, the results support the fact that in a developing and resource-rich country, the credit-based financial system is not efficient enough to support the manufacturing sector, but the development of stock markets may present alternative financial sources. This requires solving many institutional issues, including reporting, transparency, strengthening trust between economic agents, and improving the legal system. Furthermore, the development of the financial system requires the strengthening

of human capital and the growth of technological innovation, which is impossible without the development of the manufacturing sectors of the economy. Along with these, improving the quality of regulation and ensuring its effectiveness are also priorities.

The results also support the fact that general regulatory measures are not producing the desired results. Studying the impact of natural resource abundance on the relative investment attractiveness of tradable and non-tradable sectors of the economy, especially manufacturing, can provide more informed recommendations for improving the structure of resource economies. Accordingly, strengthening the targeted regulatory measures would be ideal, but at the same time, questions arise regarding the choice of objects of support. A study of the comparative advantages of domestic production in the global value chain could provide more detailed guidance on the choice of regulatory targets.

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