

STOCK MARKET DEVELOPMENT AND ECONOMIC GROWTH: THE CASE OF KAZAKHSTAN

Tolkyn Akanayeva*



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ABSTRACT

The purpose of the article. The relationship between economic growth and financial development has long been widely discussed in scientific circles. Most empirical research has led to the clear conclusion that financial markets stimulate economic development. However, in the case of financial markets in developing countries, this conclusion is not so obvious. The aim of this study is to empirically verify the relationship between economic growth and the development of the stock market (Kazakhstan Stock Exchange).

Methodology. Empirical verification of the strength and shape of the cause-and-effect relationship between real GDP growth and independent predictors will be carried out using classic linear regression models with many independent variables.

Results of the research. The results of empirical verification of the strength and shape of the cause-and-effect relationship between the growth of real GDP and independent predictors indicate that the development of the stock market has a positive impact on the growth of the country's real GDP but is not the basic factor of Kazakhstan's economic growth.

Keywords: economic growth, financial development, Kazakhstan Stock Exchange, multiple linear regression, Kazakhstan.

JEL Class: E010, G1, P2, O16.

* Master of Science in Economics, Department of Investments, University of Economics in Katowice, e-mail: tolkyn.akanayeva@gmail.com, <https://orcid.org/0000-0002-8333-0333>.

INTRODUCTION

Dynamism and globality are contemporary features of the financial market, but its role in economic development has been widely discussed in scientific circles for over 100 years. The first attempts to empirically explain the relationship between financial intermediation and long-term economic growth were made between the 19th and 20th centuries by Bagehot (1873) and Hamilton (1781). Joseph Schumpeter (1911) argued that the services provided by financial intermediaries were essential to technological innovation and economic development. Using new research instruments, Goldsmith (1969) was the first to document a positive relationship between economic growth and financial development based on an analysis of 35 countries. Many years have passed since then, the discussion on the role and impact of the financial sector on economic growth continues and no consensus has been reached yet.

The hypothesis that the development of Kazakhstan's financial market promotes the country's economic growth is supported by empirical evidence from both foreign and Kazakhstani researchers. However, there is still too little analogous empirical evidence for the Kazakh economy. Previous empirical studies have still failed to draw a detailed conclusion on whether and how the development of the stock market in Kazakhstan affects economic growth, considering that the country's economy is resource-oriented and the main export resource to the world market is oil. This is especially true for Kazakhstan due to the lack of empirical research based on the KASE public stock market panel data. Therefore, the aim of the work is to empirically verify the cause and effect relationship between economic growth and the evolution of the stock market in Kazakhstan. Due to the specificity of Kazakhstan's income structure, it is necessary to investigate the following issue: is there a relationship, and if so, what is the nature of the relationship between the country's economic growth and the development of the stock market in Kazakhstan?

1. THE RELATIONSHIP BETWEEN ECONOMIC GROWTH AND FINANCIAL DEVELOPMENT – LITERATURE REVIEW

Some of the most influential research is contained in King and Levin (1993), entitled "Finance and growth: Schumpeter Might Be Right", which found a strong positive relationship between financial development and growth. The authors conducted a cross-sectional study using data for 77 countries for the years 1960–1989. The method of its implementation corresponded to the approach that became popular at the turn of the 1980s and 1990s, in which the determinants of economic growth were sought using multiple regression. The study used four measures of financial development and controlled a number of values specific to

the countries under study, such as the initial level of GDP *per capita*, human capital, openness of the economy, the level of inflation and the share of government consumption in GDP. The obtained results indicated a statistically significant, positive impact of the level of financial development on GDP growth. This article set the basic framework of analysis for subsequent research published in the 1990s, both in terms of the measures used (usually the credit aggregate/GDP and/or the money aggregate/GDP) and the statistical tools (cross-sectional regression most often determined by the least squares method for data from a relatively wide group of countries). These studies obtained results confirming the positive impact of financial development on economic growth. In particular, as Levine (1991; 1997) and Levine and Zervos (1996) showed, equity markets accelerate human capital development and production growth by increasing liquidity and improving the efficiency of a firm's investments, which stimulates long-term economic growth.

The next era of finance and growth research began with international analysis; several econometric studies based on linear methods have provided empirical support for the leading view that finance promotes growth (Demirguc-Kunt and Levine (1996), Levine and Zervos (1998), Rioja and Valev (2004)). As a result, researchers significantly expanded the field of research and put forward hypotheses looking for causes and causality, components of markets and financial channels, their impact on economic growth, exogenous and endogenous factors, the relationship with the total productivity of production factors, the structure of the financial market: banking and stock exchange, which collectively, simultaneously or individually, directly or indirectly, affect economic growth.

In some studies, however, the authors pointed to a lack of relationship or a negative relationship (De Gregorio and Guidotti, 1995; Andersen and Tarp, 2003; Dawson, 2003; Loayza and Ranciere, 2006; Beck and Levine, 2004; Shen and Lee, 2006).

The main results of a decade of researchers' work have been systematized as follows:

- 1) countries with more efficient banks and markets grow faster,
- 2) both banking and the stock market are important for growth and their combined level of development matters,
- 3) better functioning financial systems weaken external financial constraints, suggesting that this is one of the mechanisms through which financial development affects growth.

These results, however, do not reject the view that economic activity influences financial development. The conclusion is as follows: "We are far from definitive answers to the questions: does finance cause growth, and if so, how?" (Levine, 2005: 868).

The question still stands. However, the research area has become broader in terms of available time series data, study design, and countries. It is worth noting that the direction of causality in the relationship between economic growth and financial market development is important for many developing countries: for the optimal allocation of limited financial resources between the financial and other sectors of the economy. As shown by Deidda (2006) based on the general equilibrium model, the strength of the relationship between financial development and growth generally depends strongly on the level of per capita income. Moreover, financial development occurs endogenously when the economy reaches a critical threshold of economic development and may be unsustainable in the early stages. Since then, more and more researchers have tried to explain the relationship between economic growth and finance, especially in the case of emerging or financially underdeveloped countries (in Europe, Africa and Asia). The results are mixed.

Rousseau and Wachtel (2011) argued that the relationship between finance and growth is becoming less visible. While it is strong for the period 1960–1989, it no longer occurs for later data (for the period 1990–2004). Additionally, the authors concluded that finance can support economic growth as long as a financial crisis is avoided.

Caporale et al. (2015) report that investment is the most important determinant of the growth process in ten economies (Central and Eastern European countries, Baltic countries and Southeast European countries) in the transition period, as well as of human capital and trade openness, because they improve productivity, competition and technological progress. However, loans to the private sector have a positive but insignificant impact due to the transformation process and banking crises. The capitalization of the stock exchange due to its small size has little impact on economic growth due to the general underdevelopment of the financial sector and lack of financial depth.

Aregbeshola (2016), in his research conducted for six African countries, confirms the findings of (1) "supply leading" and (2) "demand following" hypotheses for underdeveloped countries, based on Patrick's (1966) research. The first hypothesis holds that financial markets are the cause of a country's economic growth by providing the required amount of financial resources at low transaction costs. The latter hypothesis is confirmed when economic development causes an increase in demand for funds on the financial market and is therefore the cause of growth. After testing both hypotheses, it is concluded that first the African continent must develop its economy to achieve financial market development.

To develop this approach further, Pradhan (2018) observed two other hypotheses: (3) the "feedback hypothesis", which suggests that economic growth and stock market development can act synergistically, complementing and reinforcing each other, making them mutually causal or bidirectional; (4) the

"neutrality hypothesis", which suggests that stock market development and economic growth are independent of each other, meaning that stock market development plays no role in economic growth and vice versa. Using data from G20 countries, there was mixed evidence on the interrelationships between equity market development and per capita economic growth for both single country and panel cases.

Durusu-Ciftci, Ispir, Yetkiner (2017) based on data from 40 developed and financially underdeveloped countries indicated a positive impact of the development of the credit and stock markets on economic growth. They found that, in general, financial systems based on the credit market better support long-term economic growth without differentiation according to the stage of development of countries.

At the same time, several studies obtained negative estimates, e.g., Kim et al. (2014) for the period 1976–2005 for 94 countries, Creel et al. (2015) for European Union countries for the years 1998–2011, Bezemer et al. (2016) for 46 economies in the period 1990–2011, especially in the case of real estate loans.

Scientists' opinions vary greatly. One of the reasons for the lack of agreement on this issue is the high rate of change in the subject of research itself. The size, function and role of the capital market have changed: global functioning has significantly strengthened its role in economic development. Availability of capital, market depth, investment delivery efficiency and stability have become factors determining the economic policies of developed and developing countries.

It is worth noting that an extensive time series literature examines the finance and growth relationship using various time series techniques (Jung, 1986; Demetriades and Hussein, 1996; Arestis and Demetriades, 1997). Based on the ratio of money to GDP, the development of banks and stock market indicators measuring financial development, research has supported the view that finance stimulates economic growth, but with certain reservations, depending on the size of the relationship (Arestis, Demetriades, Luintel, 2001).

Domestic authors (Berdigulova (2010), Auyezbayeva, Tusupova (2014); Katenova, Nurmakhanova (2017); Oskonbaeva (2018); Nichkasova, Nezhinsky, Shmarlouskaya (2022)) and foreign authors (Neimke (2003); Akimov, Wijeweera, Dollery (2009); Li Chee., Nair (2010); Djalilov, Piesse (2011); Skare, Porada-Rochoń (2019)) studied the importance of financial development for the growth of Kazakhstan's economy. For example, Akimov et al. (2009) analyzed the impact of financial intermediation on real GDP growth using data for 27 countries representing the regions of Eastern and Southeastern Europe, the Caucasus, Central Asia (including Kazakhstan), and East Asia over the period since 1989 until 2004. Using an endogenous growth model and panel data analysis techniques, they showed that there is a strong positive relationship between financial development and economic growth in transition economies.

Oskonbaeva (2018) examines the causal relationship between financial development, trade openness and economic growth based on an empirical analysis of nine transition countries (Ukraine, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova and Tajikistan) in 1998–2015. The results suggest that there is evidence of bidirectional causality between economic growth and financial development in the short term.

Nichkasova et al. (2022) report that the financial market of Kazakhstan at the current stage does not have a significant impact on the country's economic development, but economic development causes an increase in the demand for financial resources in the banking sector and on the stock exchange, and therefore is the cause of the growth of the country's economy.

Most empirical research conducted at the end of the 20th century led to the clear conclusion that financial markets stimulate economic development. However, in the case of financial markets in developing countries, this conclusion is not so obvious, because these markets are not distinguished by the depth and diversity of financial instruments and therefore cannot provide economic entities with access to financial resources. This also means that the study of the role of the financial market in economic development remains relevant for emerging countries in general and Kazakhstan in particular.

2. THE SPECIFICITY OF KAZAKHSTAN'S ECONOMY

Nowadays, Kazakhstan is the largest and most developed country in Central Asia, with very rich natural resources. Kazakhstan's GDP exceeds the total GDP of all countries in the Central Asian region by 1.5 times (Figure 1).

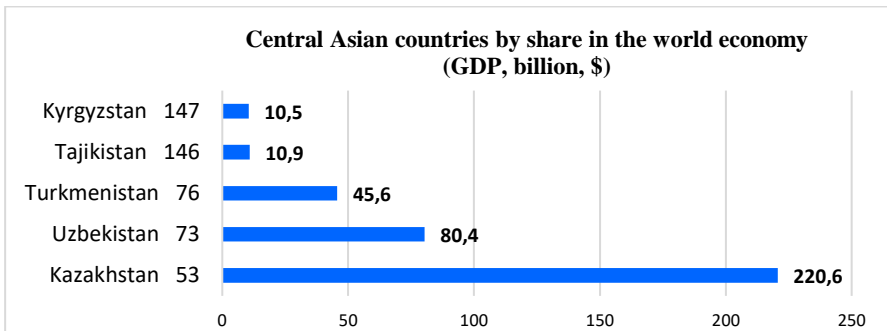


Figure 1. Central Asian countries in 2022 by share in the world economy (GDP, \$ billion)

Source: own study based on World Bank data. *Gross domestic product 2022*.

On a global scale, Kazakhstan's economy is a small open market economy. According to the World Bank, in 2022 Kazakhstan in terms of GDP ranks 54th among 209 countries in the world (*Gross Domestic Product 2022*). It is worth noting that Kazakhstan remains a leader in Central Asia in attracting foreign direct investment to the economy. Over the last 20 years, the inflow of gross foreign direct investment into Kazakhstan has averaged 14% of GDP (KazStat. *National Accounts*).

A specific, or in other words, strong and at the same time weak feature of Kazakhstan's economic model is its raw material nature. The raw material orientation of the economic model results from the fact that Kazakhstan is very rich in natural resources, especially energy and mineral resources. The focus on raw materials, fuels (mainly Brent crude oil), metals and semi-finished products sought on the world market, and the active attraction of direct foreign capital to the country's economy ensured a high GDP growth rate (in 2000–2007, an average of 10.4%, Figure 2), which gave rise to talking about the "Kazakh miracle".

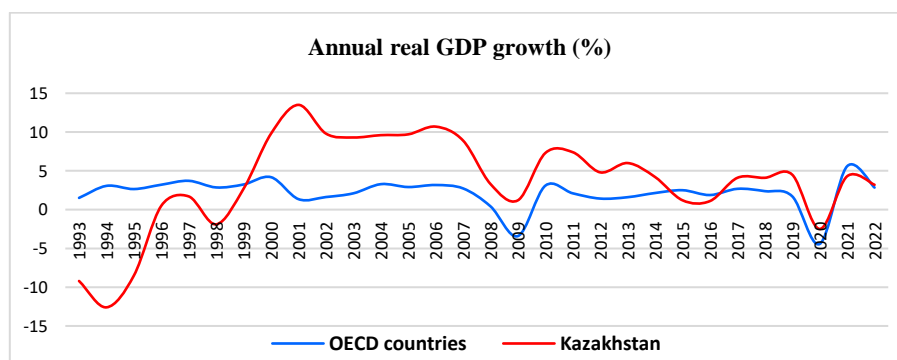


Figure 2. Annual real GDP growth (%) from 1993 to 2024

Source: own study based on data from the: OECD Stat; Bureau of National Statistics of the Republic of Kazakhstan; *Global Economic Prospects*.

However, the same factors caused a slowdown in Kazakhstan's GDP growth in the following years (to 1.2% in 2009 and 2015; to 1.1% in 2016) and a decline in the economy to 2.5% in 2020.

The sectoral orientation of the economy and the volatility of Brent crude oil prices are one of the key risk factors for the economic stability of Kazakhstan. The negative effects resulting from fluctuations in black gold prices adversely affect the main components of Kazakhstan's gross product: consumption and investments decline, government spending increases.

In order to ensure the socio-economic development of the state, as well as to reduce the sensitivity of the national economy to the impact of external conditions, in particular to fluctuations in world prices of raw materials, the government of Kazakhstan established the National Fund of the Republic of Kazakhstan in 2000 (Figure 3). A significant part of the revenues from Brent crude oil goes directly to the National Fund of the Republic of Kazakhstan (Tax Commission of the Ministry of Finance of the Republic of Kazakhstan, 2022).

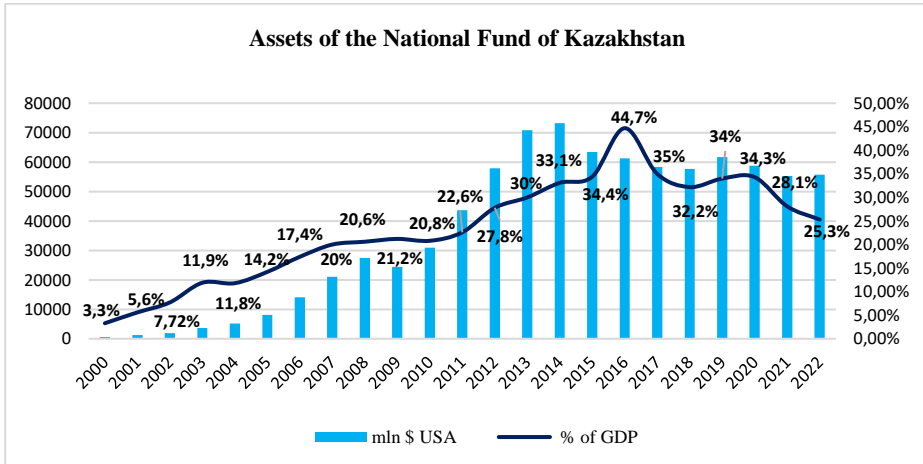


Figure 3. Assets of the National Fund of Kazakhstan, % of GDP

Source: own study based on data from: RK National Bank. *International reserves and assets of the RK National Fund*; KazStat. *National accounts*.

Since 2007, the assets of the RK Domestic Fund have served as a "safe buffer", which has repeatedly helped Kazakhstan overcome the negative impact of external shocks (transfers from the RK Domestic Fund in 2007–2008, during the global financial crisis, in 2020, from the outbreak COVID-19 pandemic).

There is a German-Japanese financial system in Kazakhstan, also known as the continental one. In addition to universal commercial banks, securities market institutions operate actively in the financial sector. In Kazakhstan, the securities market has existed for no more than 30 years. Today, the Kazakhstan Stock Exchange (KASE) is a universal, multi-functional exchange that allows trading in almost all types of securities and financial instruments with settlement in various currencies and in various ways. KASE can be conditionally divided into four main sectors: currency market, capital market (securities), money market (REPO and SWAP operations) and derivatives market.

Higher valuation of securities and fear of a global recession resulted in a reduction in the capitalization of stock markets in many countries around the world, including Kazakhstan (Figure 4).

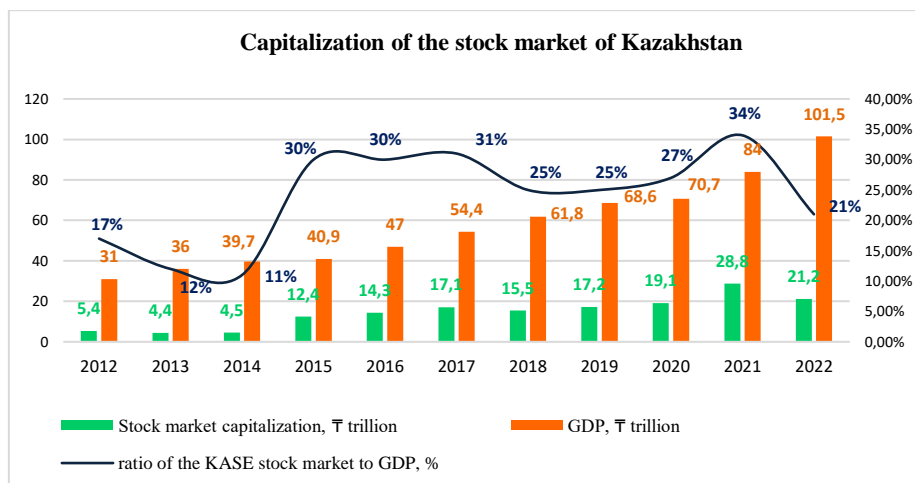


Figure 4. Capitalization of the stock market of Kazakhstan in 2012–2022

Source: own study based on data from the National Bank of the Republic of Kazakhstan and KASE [Accessed 19.11.2023]. KASE. Annual reports; KASE. Reports and presentations; Bureau of National Statistics of the Republic of Kazakhstan; KazStat. *National accounts*.

The capitalization of the stock market in relation to Kazakhstan's GDP in 2022 decreased by 13 pp up to 21% of GDP compared to 2021 (KazStat, *National Accounts*). Global challenges related to the volatility of foreign markets (*Indeks S&P 500 podsumowuje krwawy 2022 rok*), increases in base rates by global regulators, including the National Bank of the Republic of Kazakhstan (*US FED hikes rates by 25 basis points to the highest in 22 years*; European Central Bank. *Euro money market study 2022*; RK National Bank. *Schedule for making decisions on the base rate for 2015–2023*) and acceleration of inflation (*Annual report of the National Bank of Kazakhstan*) these are mainly the determinants of the decline in the capitalization of the stock market in Kazakhstan in 2022.

Over the last ten years, the stock market in Kazakhstan has undergone significant changes. Statistical data show that the volume of transactions on the KASE share market has increased on average twice over the last ten years (Table 1). In other words, if the transaction volume in 2012 amounted to ₸ 204.7 billion (US \$ 1377 million), by 2022 this value increased by 50% and reached ₸ 307.3 billion (US \$ 670 million), of which 223.4 billion ₸ came from trading in

the fourth quarter in connection with the initial public offering of NC «KazMunayGas» JSC and the increase in trading volume on the secondary market of KASE shares (*KASE Annual Report, 2022*).

Table 1. Stock market indicators in Kazakhstan (2012–2022)

KASE share market	Transaction volume		Average daily transaction volume		Average volume of one transaction		Primary market		Aftermarket	
	billion ₸	million \$*	million ₸	million \$*	million ₸	million \$*	billion ₸	million \$*	billion ₸	million \$*
2012	204.7	1377	849.9	5.7	–	–	39.3	267.8	165.4	1109.2
2013	118.2	784	471.6	3.1	–	–	7.9	59.0	110.3	725.0
2014	174.0	961	179.1	1.0	–	–	13.1	63.1	160.9	897.9
2015	899.6	4057	3698.2	16.7	21.3	0.096	0.4	1.6	889.2	4055.4
2016	250.2	731	1021.4	3.0	4.4	0.013	0.8	2.1	249.4	728.9
2017	269.4	826	1100.0	3.4	2.352	0.007	7.6	22.9	261.8	803.1
2018	539.8	1570	2194.5	6.37	3.827	0.011	0.5	5.5	539.3	1564.5
2019	203.7	532.2	827.5	2.2	1.972	0.005	<0.1	0.3	203.6	531.9
2020	238.4	577.3	969.1	2.3	1.218	0.003	3.5	8.5	234.9	568.8
2021	422.8	1010	1741.9	4.1	0.935	0.002	0.9	19.7	421.9	990.3
2022	307.3	670	1254.3	2.72	0.595	0.001	138.4	303.2	168.9	366.8

* own study based on the average annual official USD/KZT exchange rates of the RK National Bank. *Official average exchange rates for a given period.*

Source: own study based on KASE data in 2012–2022, KASE. Annual reports.

The data in Table 1 shows that the average daily volume of transactions on the secondary stock market in Kazakhstan has increased by 47.6% over the last ten years, that is, from ₸ 849.9 million (US \$ 5.7 million) in 2012 to ₸ 1254.3 million (US \$ 2.72 million) in 2022.

In the structure of issuers of the KASE stock market according to economic sectors of Kazakhstan, the largest shares are held by the financial sector, in particular commercial banks – 40.9% (Figure 5) and the energy sector (35.1%), which is represented by one company from the nuclear industry, one company from the oil industry and one company from the electricity industry.

It is worth noting that the migration of listed companies abroad has become an element of the globalization of financial markets, especially in developing markets. Over the past decades, there has been a growing migration of stock market activity to major international financial centers such as New York and London. Moreover, for many developing countries, activity in international

markets is greater than activity in their domestic market. Many scientific works indicate that the internationalization process is the result of attempts by domestic companies to escape from the poor environment within a country with weak institutions and a poorly functioning market (Karolyi, 2004).

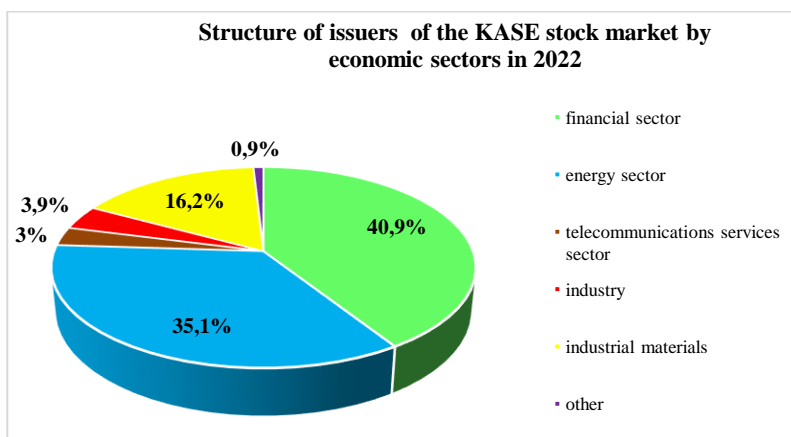


Figure 5. Structure of issuers of the KASE stock market by economic sectors

Source: own study based on data from the National Bank of the Republic of Kazakhstan and KASE [Accessed 19.11.2023]. Annual reports; KASE. Reports and presentations; Bureau of National Statistics of the Republic of Kazakhstan; KazStat. *National accounts*.

This point of view means that capital market reforms reduce the incentives for companies to internationalize, and will result in a lower share of stock market activity abroad. Of course, the very migration of stock trading to international financial centers may have a negative impact on the development of the domestic stock market (Levine, Schmukler, 2003). This leaves equity markets in many developing countries highly illiquid and fragmented, with trading and capitalization concentrated around a few companies. One such market is the stock market in Kazakhstan.

The specificity of the Kazakhstan stock market is that the shares of no more than ten companies representing various sectors of the economy can be called more or less tradable. It is known that an indicator of the development and maturity of the stock market is its liquidity. On the KASE share market, the liquidity problem is one of the most acute. The main reason for the low level of liquidity of the domestic stock market is both the limited number of interesting, high-quality issuers and the lack of serious players.

Taking into account the fact that a liquid stock market is an integral element of a market economy, Kazakhstan is taking active measures to develop it. An

empirical study of the nature of the relationship between the country's GDP growth and the development of the KASE stock market will allow a reassessment of the role and importance of the development of the Kazakh stock market.

3. METHOD AND DATA

The aim of the article is to empirically verify the strength and shape of the cause and effect relationship between economic growth and the evolution of the stock market in Kazakhstan.

We hypothesize the following:

There is a relationship between Kazakhstan's economic growth and the development of the KASE stock market.

The question arises: what is the nature of the relationship between the growth of the country's real GDP and the development of the stock market in Kazakhstan?

Verification of possible relationships between Kazakhstan's GDP growth and the following:

- a) development of the stock market in Kazakhstan (KASE);
- b) increase in prices of Brent crude oil on global markets;
- c) an increase in the overall level of credit in the economy;
- d) increase in Kazakhstan's clean exports;
- e) increase in income from the export of Brent crude oil;
- f) decrease in the USD/KZT exchange rate;
- g) increase in assets of the Kazakh National Funds;
- h) increase in investments in fixed capital;
- i) the increase in state budget expenditure will be carried out on the basis of the calculation of the Pearson linear correlation coefficient.

The r-Pearson correlation coefficient allows you to determine whether there is a linear relationship between two variables – if so, it allows you to determine its strength and its nature, i.e., positive or negative. Pearson's linear correlation coefficient can be calculated using the following formula (*Podstawy statystyki*, 2004):

$$r_{yx} = \frac{\text{cov}(x,y)}{S_x S_y} = \frac{\sum_{i=1}^N (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^N (x_i - \bar{x})^2} \times \sqrt{\sum_{i=1}^N (y_i - \bar{y})^2}},$$

where:

x_i – subsequent values of the random variable X in the sample;

\bar{x} – arithmetic mean of the sample;

y_i – subsequent values of the random variable Y in the sample;

\bar{y} – arithmetic mean of the sample;

N – number of elements in the sample.

Empirically, the study of the cause-and-effect relationship between the dependent variable and the independent variables was carried out using classic linear regression models with many independent variables (multiple regression).

The aim of multiple regression is to quantify the relationships between many independent (explanatory) variables and the dependent (criterion, explained) variable. The classic linear regression model with many independent variables (so-called multiple regression) is defined by the following equation (Rabiej, 2012):

$$Y = b_0 + b_1 x_1 + b_2 x_2 + \dots + b_k x_k + \varepsilon,$$

where:

x_i – empirical values of the independent variable X;

b_i – model parameters (partial regression coefficients) describing the influence of i – this variable;

ε – random component (S_ε).

The dependent variable is the level of real GDP of Kazakhstan. Real GDP is the value of final goods and services produced by Kazakh and foreign factors of production in Kazakhstan at constant prices in 2005.

The independent variables are: the KASE index (it is a benchmark of the domestic stock market), Brent oil prices on world markets, clean exports (trade balance) of Kazakhstan, state revenues from the export of Brent oil, the USD/KZT exchange rate, assets of the Kazakhstan National Fund, investments in fixed capital, the general level of loans in the economy, state budget expenditure.

The calculations were made in relative values (growth rates) and not in absolute terms. The data covers the period from January 1, 2007 to December 31, 2022. The dataset is generated based on data from the World Bank, International Monetary Fund, OECD, World Federation of Exchanges, National Bank of the Republic of Kazakhstan, Bureau of National Statistics of the Republic of Kazakhstan, Kazakhstan Stock Exchange.

All studies of the cause-and-effect relationship between many explanatory variables and the dependent variable were carried out using Statistica software. In Statistica, model verification involves checking whether the model assumptions are met:

- a) significance of linear regression;
- b) significance of partial regression coefficients;
- c) lack of multicollinearity (redundancy) between independent variables;
- d) assumption of homoscedasticity, which means that the variance of the random component is the same for all observations;
- e) no autocorrelation of residuals;
- f) normality of the distribution of residuals;
- g) the random component (residues ε_i) has an expected value equal to 0 (*Przystępny kurs statystyki*, 2007).

4. EMPIRICAL RESULTS

The relationship between the dependent variable and the independent variables was verified using Pearson correlation. The result is a correlation matrix (Table 2).

Table 2. Correlation matrix between the dependent variable and the independent variables

	USD/ KZT	Brent price	NF	PE	IEB	IFC	BE	KASE	LE	GDP
USD/ KZT	1.0	-0.55	-0.49	-0.54	-0.66	-0.85	-0.81	0.07	-0.86	-0.97
Brent price	-0.55	1.0	0.35	0.93	0.92	0.66	0.44	-0.06	0.71	0.65
NF	-0.49	0.35	1.0	0.37	0.51	0.46	0.53	-0.58	0.47	0.62
PE	-0.54	0.93	0.37	1.0	0.93	0.65	0.53	-0.16	0.60	0.65
IEB	-0.66	0.92	0.51	0.93	1.0	0.79	0.61	-0.21	0.67	0.75
IFC	-0.85	0.66	0.46	0.65	0.79	1.0	0.66	-0.16	0.71	0.86
BE	-0.81	0.44	0.53	0.53	0.61	0.66	1.0	-0.06	0.66	0.82
KASE	0.07	-0.06	-0.58	-0.16	-0.21	-0.16	-0.06	1.0	-0.11	-0.10
LE	-0.86	0.71	0.47	0.60	0.67	0.71	0.66	-0.11	1.0	0.85
GDP	-0.97	0.65	0.62	0.65	0.75	0.86	0.82	-0.10	0.85	1.0

Note: USD/KZT – exchange rate, Brent price – price of Brent crude oil on world markets, NF – assets of the Kazakhstan National Fund, PE – pure exports, IEB – income from export of Brent crude oil, IFC – investments in fixed capital, BE – state budget expenditure, KASE – KASE index, LE – loans in the economy, GDP – real GDP of Kazakhstan.

Source: own study based on data from the FRED. *Gross Domestic Product for Kazakhstan*; RK National Bank. *International reserves and assets of the National Fund of the Republic of Kazakhstan*; RK National Bank. *Official average exchange rates for a given period*; KASE. Shares; KazStat. *National accounts*; Brent Oil Futures Historical Data; KASE. Newsletter.

In order to verify the formulated hypothesis, we examine the relationship between the growth of real GDP and the development of the stock market in Kazakhstan. The value of the correlation coefficient is (-0.10), which indicates a low and negative linear relationship between the growth of the Kazakh economy and the growth of the KASE index. The coefficient of determination is 0.0101, which means that the growth of Kazakhstan's real GDP is only 1.01% explained by the variability of the KASE index (Table 3).

Table 3. Correlations between Kazakhstan's real GDP and the KASE index

Variable X and variable Y	Correlation are significant with $\rho < .0500$										
	medium im- portance	standard deviation	$r(X, Y)$	r^2	t	ρ	important cases	dependent constant Y	slope of dependent Y	dependent constant X	slope of dependent X
KASE index	-.0134	.338									
real GDP	-.0438	.122	-.1005	.0101	-.364	.7215	15	-.044	-.036	-.025	-.278

Source: own study.

The significance level ρ for the t statistic is greater than 0.05, which means that the correlation coefficient is insignificantly different from 0. The fact that Pearson's linear correlation coefficient is insignificant does not mean that there is no other type of correlation between GDP growth and the development of the KASE stock market.

The Pearson correlation results included in Table 2 demonstrate the relationships between real GDP and other explanatory variables. In order to empirically verify the formulated hypothesis using multiple regression, we examine the strength and shape of the correlation between the dependent variable and the independent variables. As a result of the calculations, two classic multiple regression models with many variables were built:

MODEL 1. Linear multiple regression model between Kazakhstan's GDP and the RK National Fund, world Brent oil prices, KASE index and exchange rate;

MODEL 2. Linear multiple regression model between Kazakhstan's GDP and state budget expenditure, investments in fixed capital and the overall level of loans in the economy.

In the case of MODEL 1, the dependence of the growth of Kazakhstan's real GDP on the growth of assets of the RK National Fund, world prices of Brent oil, the KASE index and the USD/KZT exchange rate can be described by the following equation:

$$Y = 0.178 \times \text{growth rate of assets of the RK National Fund} + 0.050 \times \text{growth rate of world prices of Brent oil} + 0.042 \times \text{growth rate of the KASE index} - 0.627 \times \text{growth rate of the USD/KZT exchange rate} + 0.0019 \pm 0.017.$$

The correlations between GDP growth and the increase in the assets of the RK National Fund, global Brent oil prices, the KASE index and the decline in the USD/KZT exchange rate can be presented using a chart as follows (Figure 6).

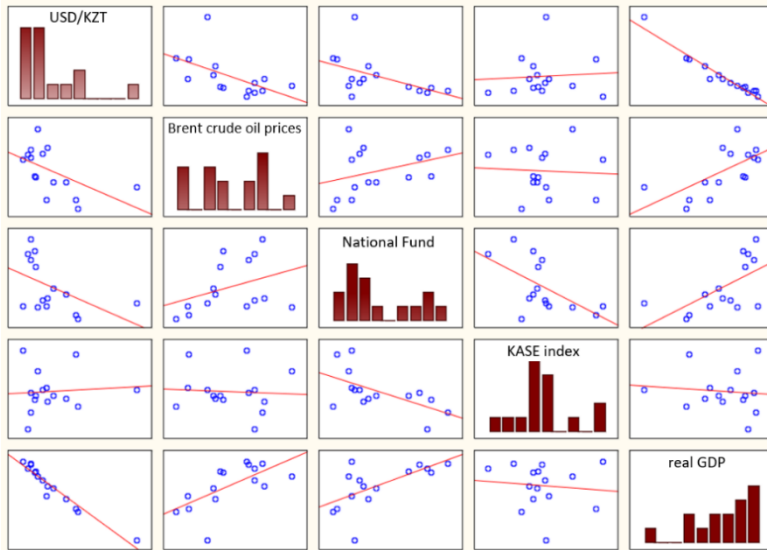


Figure 6. Correlation Figure between Kazakhstan's GDP and the RK National Fund, global Brent oil prices, the KASE index and the USD/KZT exchange rate

Source: own study.

MODEL 2 presents the dependence of the growth of Kazakhstan's real GDP on the increase in Kazakhstan's budget expenditure, investments in fixed capital and the general level of loans in the economy can be described by the equation:

$$Y = 0.226 \times \text{the growth rate of Kazakhstan's budget expenditure} + 0.333 \times \text{the growth rate of investments in fixed capital} + 0.286 \times \text{the growth rate of the overall level of credit in the economy} - 0.066 \pm 0.04.$$

The relationship between GDP growth and the increase in Kazakhstan's budget expenditure, investments in fixed capital and the general level of loans in the economy is presented in Figure 7.

The empirical verification of the research hypothesis proves that the economic growth of Kazakhstan depends on:

- increase in assets of the RK National Fund;
- increase in global prices of Brent crude oil;
- increase in the KASE index;

- d) decline in the USD/KZT exchange rate;
- e) increase in state budget expenditure;
- f) increase in investments in fixed capital;
- g) an increase in the overall level of loans in the economy.

The cause and effect relationship between the dependent variable and the explanatory variables is presented in MODEL 1 and MODEL 2.

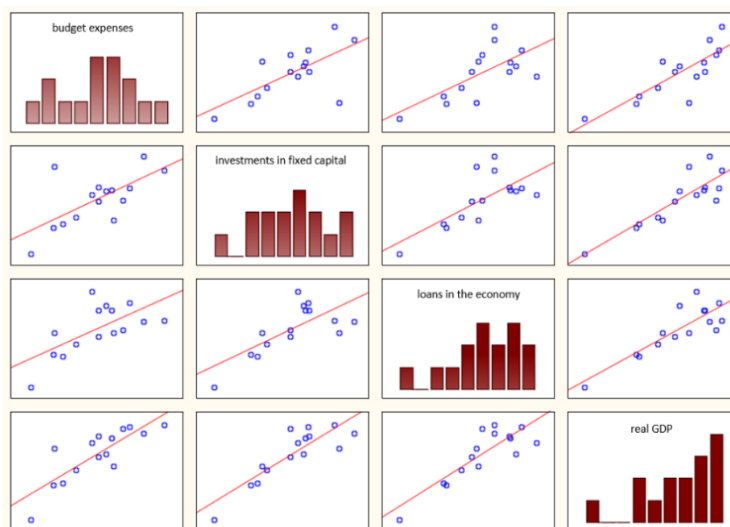


Figure 7. Correlation Figure between Kazakhstan's GDP and state budget expenditure, investments in fixed capital and loans in the economy

Source: own study.

CONCLUSION

The article above presents two models of growth of the Kazakh economy in 2007–2022:

1) Kazakhstan's real GDP growth = $0.178 \times$ growth rate of assets of the RK National Fund + $0.050 \times$ growth rate of world prices of Brent oil + $0.042 \times$ growth rate of the KASE index – $0.627 \times$ growth rate of the USD/KZT exchange rate + 0.0019 ± 0.017 .

2) Kazakhstan's real GDP growth = $0.226 \times$ the growth rate of Kazakhstan's budget expenditure + $0.333 \times$ the growth rate of investments in fixed capital + $0.286 \times$ the growth rate of the overall level of credit in the economy – 0.066 ± 0.04 .

In other words, the study of the strength and shape of the causal relationship between the dependent variable and the independent variables showed that:

1) in the period 2007–2022, the growth of Kazakhstan's real GDP was correlated with:

- a) increase in assets of the RK National Fund;
- b) increase in the KASE index;
- c) increase in global prices of Brent crude oil;
- d) decline in the USD/KZT exchange rate;
- e) increase in state budget expenditure;
- f) increase in investments in fixed capital;
- g) an increase in the overall level of credit in the economy.

2) there is a positive impact of the development of the KASE stock market on the economic growth of Kazakhstan.

This confirms the hypothesis of the work that there is a relationship between the economic growth of Kazakhstan and the development of the KASE stock market.

Taking into account the fact that the development of the stock market has a positive impact on economic growth, Kazakhstan needs to continue to increase the liquidity and attractiveness of the public stock market by expanding the range of financial instruments and the circle of issuers and investors KASE.

The issue of the relationship between economic growth and the development of the KASE stock market presented in the article does not exhaust the entire issue due to its very wide scope, significantly going beyond the scope of the publication. The models presented in the article describing the growth of the Kazakh economy do not exhaust the issues and constitute an incentive for further in-depth research.

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ROZWÓJ RYNKU AKCJI A WZROST GOSPODARCZY: PRZYPADEK KAZACHSTANU

Cel artykułu. Większość badań empirycznych doprowadziło do jednoznacznego wniosku, że rynki finansowe stymulują rozwój gospodarczy. Jednak w przypadku rynków finansowych w krajach rozwijających się wniosek ten nie jest już tak oczywisty. Oznacza to również, że badanie roli rynku finansowego dla rozwoju gospodarczego pozostaje aktualne dla krajów wschodzących w ogóle, a w szczególności dla Kazachstanu. Celem artykułu zatem jest empiryczna weryfikacja związku pomiędzy wzrostem gospodarczym a rozwojem rynku akcji KASE (Kazakhstan Stock Exchange).

Problem badawczy. Hipotezy. Z poprzednich badań empirycznych w dalszym ciągu nie udało się wyciągnąć szczegółowego wniosku na temat tego, czy i w jaki sposób rozwój rynku akcji GPW w Kazachstanie wpływa na wzrost gospodarczy biorąc pod uwagę, że gospodarka kraju ma orientację surowcową, a głównym zasobem eksportowym na rynek światowy jest ropa naftowa marki Brent. Zakładamy hipotezę: Istnieje zależność pomiędzy wzrostem gospodarczym Kazachstanu i rozwojem rynku akcji KASE.

Metoda. Źródła danych. Empirycznie badanie przyczynowo skutkowej zależności związku pomiędzy zmienną zależną a zmiennymi niezależnymi zostało przeprowadzone za pomocą klasycznej modeli regresji liniowej z wieloma zmiennymi niezależnymi. Zmienną zależną jest poziom realnego PKB Kazachstanu. Zmiennymi niezależnymi są: indeks KASE, ceny ropy na rynkach światowych, eksport netto, dochody państwa z eksportu ropy, kurs USD/KZT, aktywa Funduszu Krajowego, inwestycje w kapitał trwały, wydatki budżetu, ogólny poziom kredytów w gospodarce. Zbiór danych jest generowany na podstawie danych Banku Światowego, Międzynarodowego Funduszu Walutowego, OECD, Światowej Federacji Giełd, Biuro Statystyk Krajowych Republiki Kazachstanu, GPW w Kazachstanie.

Wyniki. Wyniki empirycznej weryfikacji siły i kształtu związku przyczynowo-skutkowego pomiędzy wzrostem realnego PKB a niezależnymi predyktorami wskazują, że rozwój rynku akcji KASE dodatnie wpływa na wzrost realnego PKB kraju, ale nie jest podstawowym czynnikiem wzrostu gospodarczego Kazachstanu.

Wnioski. Wzrost gospodarczy Kazachstanu w okresie czasu 2007–2022 można opisać równaniem:

1. Wzrost realnego PKB = $0,178 \times$ stopy wzrostu aktywów Funduszu Krajowego RK + $0,050 \times$ stopy wzrostu światowych cen ropy marki Brent + $0,042 \times$ stopy wzrostu indeksu KASE – $0,627 \times$ stopy wzrostu kursu USD/KZT + $0,0019 \pm 0,017$.
2. Wzrost realnego PKB = $0,226 \times$ stopy wzrostu wydatków budżetu państwa + $0,333 \times$ stopy wzrostu inwestycji w kapitał trwały + $0,286 \times$ stopy wzrostu ogólnego poziomu kredytów w gospodarce – $0,066 \pm 0,04$.

Słowa kluczowe: wzrost gospodarczy, rozwój finansowy, rynek akcji KASE, regresja wieloraka, Kazachstan.

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