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IMPACT OF THE FOREIGN DIRECT INVESTMENT AND LOGISTICS DEVELOPMENT ON THE COUNTRY'S ECONOMIC GROWTH: CASE OF THE REPUBLIC OF KAZAKHSTAN

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ABSTRACT

Purpose. According to Kazakhstan's strategic geographical location and its aspirations to become a major transit and logistics hub in Central Asia, the purpose of the study is to investigate the relationship between economic growth and other variables as foreign direct investments and logistic performance.

Methods. The data is derived from the World Bank Data from 2007-2023 years. The research employs econometric modelling, based on previous studies and data analysis techniques. Correlation matrix is conducted prior to understand the relation between the performed variables.

Originality / value of the research. By analyzing the data and employing econometric techniques, the research provides empirical evidence on how these factors influence the economic growth in the Republic of Kazakhstan. Furthermore, adding logistics performance in the analysis as a key variable shows the specificity of the research, considering the Kazakhstani ambitions to bolster its logistics infrastructure.

Findings. The regression analysis indicates that the model has a high explanatory power. This indicates that GDP can be explained by the independent variables that are under the authors' consideration. Logistics performance and energy consumption show statistically significance, while Foreign Direct Investment (FDI), urban population growth and inflation do not have statistically significant power.

The findings underscore the critical role of logistics performance in driving economic growth in the Republic of Kazakhstan. Investments in improving logistics infrastructure and efficiency are likely to yield substantial benefits for the economy.

Keywords: Logistics Performance Index, foreign direct investments, gross domestic product (GDP), inflation, energy consumption.

INTRODUCTION

Kazakhstan is considered as a heart of the Central Asian region. Its geographical location and resource potential at the crossroads of Europe and Asia gives a lot of opportunities for the country, as it is a natural transit route for goods moving from regions to regions. To enhance logistics opportunities, government also stimulates domestic investments, as investing in developing transportation infrastructure (roads, railways, airports and etc.). Its strategic location and supportive investment climate make it an attractive Foreign Direct Investment (FDI) destination, as well as a key player in regional trade and transportation networks.

Kazakhstan also has economic transition zones, as Khorgos-Eastern Gate. It is located in the board of China and serves as a major transition hub for rail and road freight between China and Europe under the Belt and Road Initiative. Also, Kazakhstan is considered as a part of the Trans-Caspian International Transport Route, connecting China to Europe. Kazakhstan is also a member of various transport agreements and initiatives, as Eurasian Economic Union and International North-South Transport Corridor [1]. Even though the main trade flow between Asia and Europe is over-maritime route according to the Ocean Trade Map published by United Nations Conference on Trade and development, the inland trade can be a reliable alternative to mitigate the regional political risks like those in Red Sea and South China Sea, and to solve technical problems in port expansion such as land limitation, berth availability and environmental issues as well.

It is paramount to shift a small portion of shipping through inland water routes from that of maritime routes by diversifying logistic options. Moreover, this is not only a priority but an intrinsic feature as the involvement of international trade is likely to rise between the regions within the Eurasian continent, in particular between Europe and East Asia, Middle East and East Asia, and Europe and Southeast Asia. The Middle Corridor has gone up in cargo volumes figures, with the trend indicating that it is vital to establish transport infrastructure to meet the demands.

However, it should be noted that even if Kazakhstan aims to become the largest transit and logistic hub in Central Asia, there is a very small share of logistics in GDP. In order to identify these issues and problems, we seek to identify the relation between the economic growth and foreign direct investments along with the logistics.

Literature review. In the context of globalization, logistics play a very important role in enhancing competitiveness and attracting foreign direct investments. High costs of logistics can lead to economic competitiveness, leading to efficient logistic systems essential for various types of companies [2]. Different authors emphasize the importance of logistics in driving economic development. The authors highlight the positive relationship between logistics infrastructure and economic growth [3;4]. Some authors analyzed the relationship between transport infrastructure and economic growth in developing countries, as Mauritius. These authors highlight the role of infrastructure development in cost reduction and logistics increase in the country's GDP, which is associated with the economic growth [5]. Similarly, other authors analyzed the economic impact of the seaports in Asian countries, as China and Korea, and identified that there is a very high level of contribution in port infrastructure and regional economic growth [6;7].

New policies and measures, new productions are the most important strategies for the developing countries to increase the FDI flow in terms of a direct link [8]. Overall, both transportation and foreign direct investments depend on multiple different factors, including logistics infrastructure, energy consumption, environmental conditions and macroeconomic factors as well. There are two types of FDI: vertical and horizontal.

In case of the vertical FDI, the focus is on spatial dispersion of the firm's production process rather than on mere national level of operations. It is the level of the global supply chain which is being taken into consideration here. For example, subsidiaries in the developing countries are normally following labor-intensive model for the production of intermediate goods which are to be delivered to the parent company located in the highly-developed nation. This type of FDI typically goes under the name of efficiency-seeking or cost-savings FDI, since the predominant aim is to increase the efficiency of production of the particular firm.

There is an alternative method of Horizontal FDI which demands the same product manufacturing in various plants and marketing through affiliate production rather than exporting from home country. The other kind of FDI is labeled as either "market-seeking" FDI or simply «market-oriented» FDI that allows investors to gain from the differences in costs or markets in two or more countries. Inbound FDI to developed country is usually the horizontal investment, aimed at tapping into local market. Such capital investments generally increase the labor-intensive nature of local production within the original country as they create new processes and sectors within it to produce for local consumers [9].

According to the data, in Kazakhstan we have both types of FDI: horizontal and vertical, which means that Kazakhstan is a very attractive country for investments, especially investments in resource and manufacturing industries. FDI has a strong impact on the economic growth in general (Table 1) [10].

Table 1 – FDI impact on the economic growth

Reasoning	Impact
FDI – source of the additional capital	Capital from foreign sources, which is used for various development projects or infrastructure improvements.
FDI – job places creation	Employment opportunities in logistic area.
Economic diversification	Reduction of oil dependence, growth stimulation in various areas, including logistics.
Major FDI contributors	China, Russia, the USA, the EU
Note – compiled by the author based on [10]	

MAIN PART

Methods. There are various factors influencing economic growth and numerous authors analyze their impact, employing econometric models. This research is based on the previous studies [11; 12]. The authors use different indicators to prove that both FDI and logistics development make an impact on the economic growth in general.

Foreign direct investment is considered as a catalyst for any economic development with the help of the transfer of technology [13]. FDI also stimulates employment opportunities and promotes exports and internal production.

Energy consumption is identified as a crucial factor driving economic growth, emphasizing its importance in domestic production processes [11].

Urbanization is another significant factor contributing to economic activity. It accelerates industrialization and transforming the production structure in technology – oriented sectors [14]. The interplay of these factors is crucial to foster sustainable economic development (Figure 1).

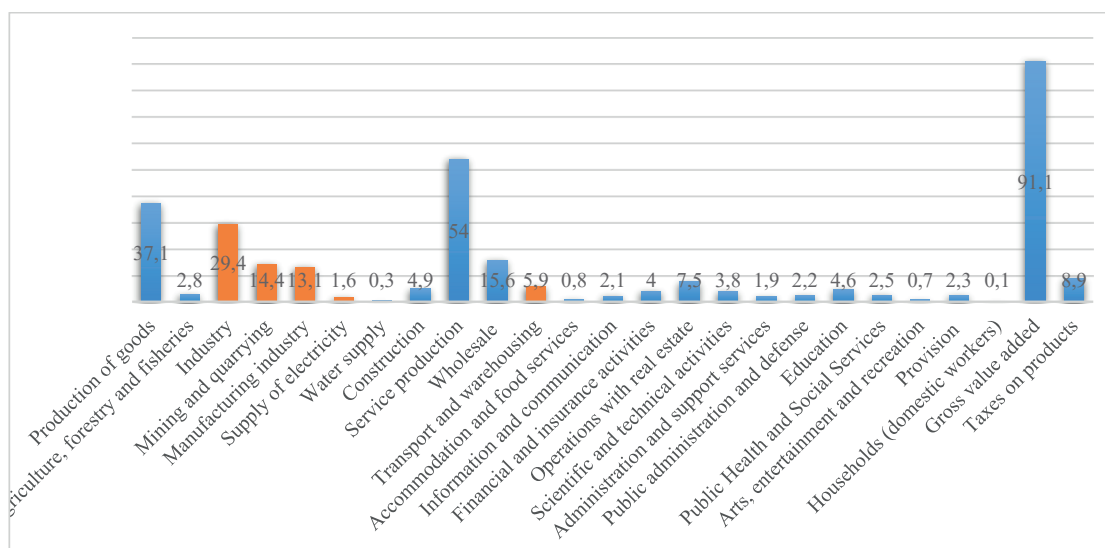


Figure 1 – GDP by sectors of the economy

Note – Compiled by the author based on [15]

The World Bank Data represents the Logistics performance index across the countries. Kazakhstan has the moderate performance index. The LPI reflects country's logistics perceptions, indicating the custom's clearance process, quality of the infrastructure (trade and transport), priced shipments, their ease of arrangements, logistics services quality, frequency of shipment and ability to track and trace consignments. The lowest index is 1, while the highest is 5. The index is considered as a benchmark and helps to show for both countries and investors the opportunities and challenges that can arise in the logistics area [16].

The Logistics Performance Index (LPI) by the World Bank helps countries identify trade logistics challenges and opportunities to enhance their performance. The 2023 edition ranks 139 countries, focusing solely on the international aspect, unlike previous editions, which also included domestic surveys. The LPI evaluates efficiency in customs and border management, quality of trade and transport infrastructure, ease of arranging competitively priced international shipments, competence and quality of logistics services, ability to track and trace consignments, and the frequency of on-time deliveries [17].

Considering that these indicators allow us to indicate and analyze the impact of FDI and logistics on economic growth, the OLS model can be constrained with the help of following factors (Table 2).

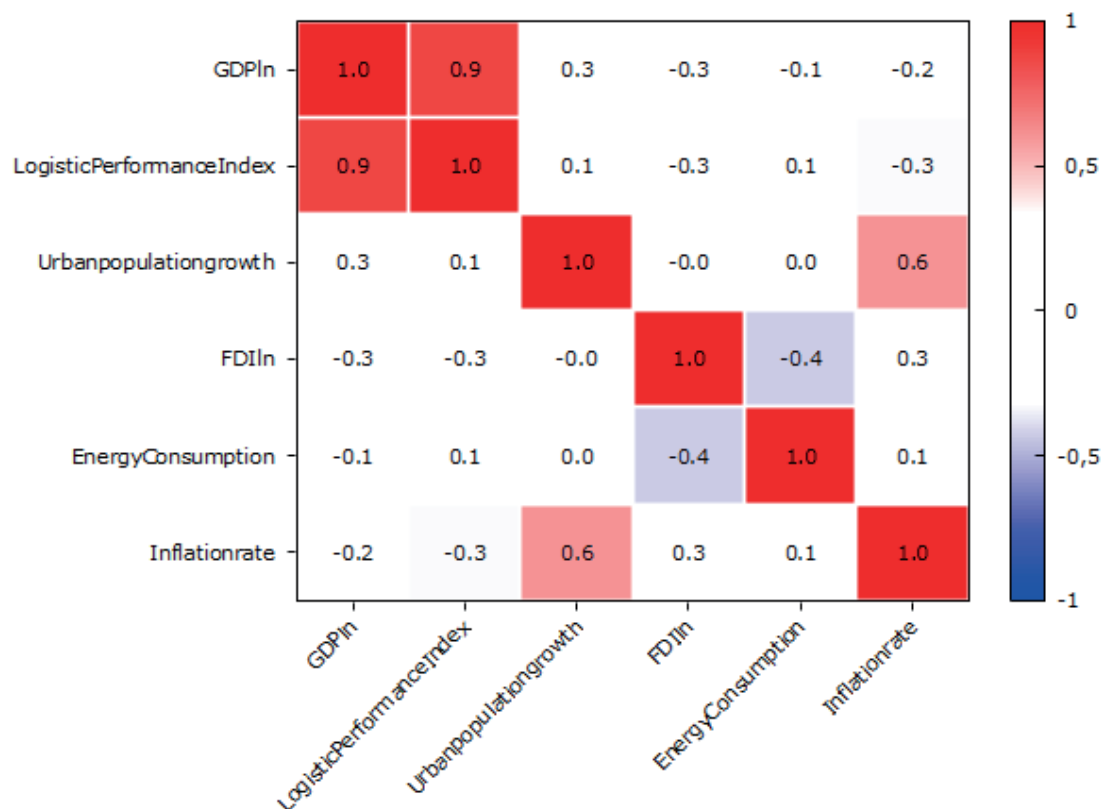
Table 2 – Description and measurement of variables

Variable		Description	Measurement
Y		Gross domestic product	Constant from 2007 (USD)
Y (ln)		Gross domestic product (ln)	Constant from 2007 (USD ln)
L		Logistics Performance Index	Index of logistical performance in KZ (1 from 1 to 5)
E		Energy consumption	Kg of Oil equivalent
F		Foreign direct investments	Constant from 2007 (USD)
F (ln)		Foreign direct investments (ln)	Constant from 2007 (USD ln)
I		Inflation rate	Consumer price index
U		Urban population growth	% of urban population growth

Note – compiled by the author based on [11;16]

The variables, described above can help to better understanding and further exploration the mechanisms through which they can have an impact on the economic growth.

Before making a regression analysis, we provided the correlation analysis represented below (Picture 2). Correlation refers to the dependence between two variables, more precisely by the measure of how strongly they linearly alter. We identify positive correlation (e. g., 0.9): continuous regression of the value of logarithm of the logistic performance index on GDP of Kazakhstan, coefficients of which are close to one, allows to conclude that, as Kazakhstan's GDP increases, its logistic performance index is also most likely significantly increasing. Correlation between GDP and the logistic performance index in Kazakhstan is the greatest positive correlation among all studied countries. It is implied that the dynamics of the Kazakh economy have a robust positive impact on the logistic performance index. In consequence, the high-quality relationship implies that economic growth in Kazakhstan is prone to be closely tied to the development of logistics performance.



Picture 2 – Correlation matrix

Note – compiled by the authors based on [16]

According to the matrix, we also identified negative correlation (e. g., -0. 4): If r is negative, it implies that as a variable is increasing, the other variable reacts oppositely. As a further instance, an anticorrelation coefficient can be of -0. 4 FDI and energy consumption has linear inverse relation that the greater the FDI is, the smaller the energy consumption will be, although it is not as strong. There is a roughly inverse relationship between FDI and energy utilization. This implies that as the foreign direct projects in the region or country increase, the variety of energy types in a country definitely, decrease to a certain extent. There is this kind of relationship still, but it means that the contribution of other forces is also much substantial when it comes to determining the energy usage.

Correlation 0. 6 (Urban Population Growth and Inflation Rate): has a positive moderate correlation with the inflation rate suggesting that fastest urbanization may trigger price hikes. This puts across second point which implies, as the urban population growth rate increase inflation rate also tends to grow. A correlation of 0. 6 means that we observe a not-so-weak connection to point out that in case of overpopulation of towns this can be an effective cause of inflation (Picture 2) [16].

Results and discussions. We build the model of multiple linear regression, the function of which is to depict the dependent variable Y(ln) (economic growth of the country).

$$\hat{Y}_{ln} = 25,0 + 0,000437 * I - 0,235 * E - 0,0458 * F(ln) + 0,836 * L \quad (1)$$

Table 3 – Regression model

	Coefficient	St. error	T-statistics	P-value
const	25,0196	0,930031	26,90	2,18e-011 ***
I	0,000437104	0,0108224	0,04039	0,9685
E	-0,235063	0,101558	-2,315	0,0410 **
F (ln)	-0,0457678	0,0351982	-1,300	0,2201
L	0,836074	0,124879	6,695	3,40e-05 ***
U	0,0838890	0,0551877	1,520	0,1567
R-square = 0,881				
Note – compiled by the authors based on [16]				

According to the regression results, the model has high explanatory power, as R-squared value is 0,881, suggesting that about 88,8% of the variation in the dependent variable of GDP_{ln} is explained by the independent variables that are included in the model. Inflation rate has a p-value of 0.9685 that is not statistically significant at conventional levels. Energy consumption suggests the association with GDP in this model: higher energy consumption – lower GDP. Urban population growth also does not appear to be statistically significant at conventional levels. FDI is also not statistically significant. However, the logistic performance index has a very low p-value, indicating that it is highly significant. A higher logistics performance index is associated with higher GDP.

GDP growth in Kazakhstan is more influenced by logistics performance than by FDI, as indicated by a regression model analyzing these factors. While FDI may not have a direct impact on GDP growth, a higher ranking on the Logistics Performance Index (LPI) can lead to significant logistical improvements over time. Enhanced logistical efficiency, including better export-import handling processes, can boost trade levels, reduce costs, and create a more favorable economic environment, thereby promoting economic development.

CONCLUSION

Kazakhstan doesn't need to do more than improve its logistics infrastructure and performance. Transportation infrastructure investments in transportation networks, supply chain efficiency, customs and procedures can constitute a major factor for economic development.

GDP growth in Kazakhstan is more affected by logistics performance than it is by FDI, given that the regression model which incorporated these factors. Though FDI may not show a direct relationship with the GDP growth, a higher ranking on the Logistics Performance Index (LPI) has the potential to induce logistic

changes over time. Logistical efficiency encompasses such areas as the export-import handling process, which can in turn raise the level of trade, decrease costs, and build a more favorable economic environment resulting in economic development.

Whether the direct association between FDI and economic growth is negligible or not, the way in which FDI establishments can decrease energy consumption, which could possibly cause innovations and development in technology and infrastructure, should not be downplayed. Policies that bring FDI and focus on achieving sustainable and efficient energy use could support green transition and competitive operations. The positive relationship between urban population expansion and inflation implies to include balanced urban development policies as part and parcel of national agendas.

As a result, we showed that Kazakhstan's economy has exceptional growth. This is directly related to logistics performance. Also, FDI is more complex and may even play an indirect role by means of efficiency improvements, and other indirect channels. Due to the crucial role of logistics in FDI, the officials have to broaden logistics skills while also creating proper environment for sustainable and fruitful FDI.

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**ТІКЕЛЕЙ ШЕТЕЛДІК ИНВЕСТИЦИЯЛАР МЕН ЛОГИСТИКАНЫҢ
ДАМУЫНЫҢ ЕЛДІҢ ЭКОНОМИКАЛЫҚ ӨСУІНЕ ӘСЕРІ:
ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ МЫСАЛЫНДА**

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АНДАТПА

Зерттеу мақсаты. Қазақстанның стратегиялық географиялық жағдайын және оның Орталық Азиядағы ірі транзиттік және логистикалық орталыққа айналуға ұмтылысын ескере отырып, зерттеудің мақсаты экономикалық өсу мен тікелей шетелдік инвестициялар мен логистикалық көрсеткіштер сияқты басқа да айнымалылар арасындағы байланысты зерттеу болып табылады.

Әдіснамасы. Деректер 2007-2023 жылдардағы World Bank Data-дан алынған. Зерттеу алдыңғы зерттеулер мен деректерді талдау әдістеріне негізделген эконометрикалық модельдеуді қолданды. Логистиканың, ТШИ-дің, энергияны тұтынудың, урбанизацияның және инфляция деңгейінің маңыздылығы туралы әдебиеттерге шолу негізінде авторлар эконометрикалық регрессиялық модель құрастырады. Зерттелетін айнымалылар арасындағы байланысты түсіну үшін корреляциялық матрица жасалады.

Зерттеудің бірегейлігі / құндылығы. Деректерді талдау және эконометрикалық әдістерді қолдану арқасында зерттеу осы факторлардың Қазақстан Республикасындағы экономикалық өсуге қалай әсер ететіні туралы эмпирикалық деректерді ұсынады. Бұдан басқа, логистика көрсеткіштерін талдауға негізгі айнымалы ретінде енгізу Қазақстанның логистикалық инфрақұрылымды нығайтуға ұмтылысын ескере отырып, зерттеудің ерекшелігін көрсетеді.

Зерттеу нәтижелері. Регрессиялық талдау модельдің жоғары түсіндіру қабілеті бар екенін көрсетеді (R-квадрат 0,88). Бұл ЖІӨ авторлар қарастыратын тәуелсіз айнымалылармен түсіндірілуі мүмкін екенін көрсетеді. Логистика мен энергияны тұтыну тиімділігінің көрсеткіштері статистикалық маңыздылығын көрсетеді, ал ТШИ, қала халқының өсуі және инфляция статистикалық маңызды күшке ие емес.

Алынған деректер Қазақстан Республикасындағы экономикалық өсуді ынталандырудағы логистика тиімділігінің маңызды рөлін көрсетеді. Логистикалық инфрақұрылымды жақсартуға және тиімділікті арттыруға инвестиция салу экономикаға айтарлықтай пайда әкелуі мүмкін.

Түйін сөздер: логистикалық тиімділік индексі, тікелей шетелдік инвестициялар, жалпы ішкі өнім (ЖІӨ), инфляция, энергияны тұтыну.

ВЛИЯНИЕ РАЗВИТИЯ ПРЯМЫХ ИНОСТРАННЫХ ИНВЕСТИЦИЙ И ЛОГИСТИКИ НА ЭКОНОМИЧЕСКИЙ РОСТ СТРАНЫ: НА ПРИМЕРЕ РЕСПУБЛИКИ КАЗАХСТАН

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АННОТАЦИЯ

Цель исследования. Учитывая стратегическое географическое положение Казахстана и его стремление стать крупным транзитным и логистическим центром в Центральной Азии, целью исследования является изучение взаимосвязи между экономическим ростом и другими переменными, такими как прямые иностранные инвестиции и логистические показатели.

Методология. Данные взяты из World Bank Data за 2007-2023 годы. В исследовании использовано эконометрическое моделирование, основанное на предыдущих исследованиях и методах анализа данных. На основе обзора литературы о значимости логистики, ПИИ, энергопотребления, урбанизации и уровня инфляции авторы строят эконометрическую регрессионную модель. Для понимания связи между исследуемыми переменными проводится корреляционная матрица.

Оригинальность / ценность исследования. Благодаря анализу данных и использованию эконометрических методов, исследование предоставляет эмпирические данные о том, как эти факторы влияют на экономический рост в Республике Казахстан. Кроме того, включение в анализ показателей логистики в качестве ключевой переменной показывает специфику исследования, учитывая стремление Казахстана к укреплению логистической инфраструктуры.

Результаты исследования. Регрессионный анализ показывает, что модель обладает высокой объясняющей способностью (R-квадрат 0,88). Это указывает на то, что ВВП может быть объяснен независимыми переменными, которые рассматриваются авторами. Показатели эффективности логистики и энергопотребления демонстрируют статистическую значимость, в то время как ПИИ, рост городского населения и инфляция не имеют статистически значимой силы.

Полученные данные подчеркивают критическую роль эффективности логистики в стимулировании экономического роста в Республике Казахстан. Инвестиции в улучшение логистической инфраструктуры и повышение эффективности могут принести значительные выгоды для экономики.

Ключевые слова: Индекс эффективности логистики, прямые иностранные инвестиции, валовой внутренний продукт (ВВП), инфляция, энергопотребление.

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