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-RESEARCH ARTICLE-

DOES THE EXPORT-LED GROWTH OR IMPORT-LED GROWTH HYPOTHESIS WORK FOR KAZAKHSTAN? A COINTEGRATION AND GRANGER CAUSALITY INVESTIGATION

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─Abstract─

This study examines the directional relationship between trade components, namely

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exports and imports, and GDP growth in Kazakhstan. Covering the period from 1993 to 2024, it explores how major structural transformations within the Kazakh economy have reshaped the interaction between international trade flows and national output. To ensure the robustness of the analysis, a three-stage econometric approach is implemented. Initially, stationarity is assessed through the Augmented Dickey-Fuller (ADF) unit root test to establish the integration order of the variables. Subsequently, a Vector Autoregression (VAR) model, applied within a stationary framework, is used to detect stable long-run relationships among exports, imports, and economic growth. Finally, the Granger causality test alongside the Engle-Granger cointegration technique is employed to determine the direction and existence of causal linkages among the variables. The results support the import-led growth hypothesis in the context of Kazakhstan. Although the country has traditionally been viewed as a resource-driven economy with strong reliance on the extractive industry, the empirical evidence suggests an evolving pattern in its growth dynamics. The findings further reveal that sustained economic expansion is more strongly associated with reliable access to advanced imported technologies, indicating that imports play a more decisive role than exports in converting resource-based income into long-term economic development.

Keywords: Economic Growth, Gross Domestic Product, Kazakhstan's Economy, Export, Import, and Granger Causality Test.

INTRODUCTION

Following the dissolution of socialist union republics, the Commonwealth of Independent States (CIS) embarked on a series of economic reforms aimed at establishing market-oriented frameworks with a strong emphasis on trade liberalisation. In Kazakhstan, the State Stabilisation Programme advanced a broad agenda of economic liberalisation by progressively reducing governmental intervention across sectors. A key element of this initiative was the removal of barriers to foreign trade, thereby granting all enterprises, irrespective of scale or sector, unrestricted participation in international markets. This represented a decisive shift away from a centrally planned trade regime, enabling firms to engage directly with global markets and strengthening competitive market dynamics.

Akimov and Dollery (2008) observe that Kazakhstan undertook substantial trade liberalisation measures in the early phase of its independence, including the removal of export quotas and the elimination of both export and import licensing requirements, as also highlighted by Abduvaliev and Bustillo (2021). Within this context, prior research indicates that empirical analyses of trade indicators and their integration into the global economy contribute to greater trade openness and enhanced economic welfare. This perspective is reinforced by studies such as Berg and Schmidt (1994), Sachs et al. (1995), Cooper (2001), and Doan (2019), which collectively demonstrate that trade

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liberalisation, openness, and international exchange act as catalysts for economic growth. According to Keho (2017), such liberalisation enables firms to assess and improve their competitiveness in a demanding global environment, while Hillman (2008) further notes that openness in trade is often accompanied by the liberalisation of international capital flows.

In 1991, Kazakhstan experienced a sharp contraction in both exports and imports following the dissolution of the Soviet Union and the collapse of its trade and payment systems. This economic disruption severely affected international trade, contributing to a broader economic downturn. As highlighted by Freinkman et al. (2004), these developments led to a pronounced decline in regional output, exacerbated by the cessation of fiscal transfers from Moscow. The centrally planned system had fostered a structural reliance on inter-republican supply networks, which shaped the economic framework until independence. Although CIS countries expanded their export destinations for natural resources and raw materials, Russia remained a dominant trading partner for most CIS economies (Akhter et al., 2022).

This study analyses Kazakhstan over the period 1993 to 2024, using annual data to examine the causal interplay between trade variables and economic growth. Employing a VAR framework, the study tests for Granger causality between export growth, import growth, and GDP growth, thereby contributing to the export-led growth hypothesis in the context of Kazakhstan. While resource-rich developing economies are often classified as export-driven and supported by evidence linking exports to growth, this research addresses a key gap by demonstrating that Kazakhstan's post-independence structural transformation has shifted its growth trajectory away from an export-dependent model towards one more reliant on imports.

Moreover, the analysis confirms a measurable association between trade variables and economic growth, with the primary contribution lying in the identification of a post-independence structural transition that has altered the determinants of economic expansion, particularly influencing the export–import balance. The findings support the import-led growth hypothesis in Kazakhstan, while also revealing heterogeneous effects of different import categories on non-import GDP. In particular, imports of capital goods, advanced machinery, and technological inputs are found to have a stronger positive impact on output growth. Consequently, it is recommended that Kazakhstan pursue a targeted import liberalisation strategy that prioritises capital-intensive and high-technology imports to enhance industrial productivity and sustain long-term economic growth.

LITERATURE REVIEW

The literature presents a wide range of perspectives on the relationship between exports and economic growth, as evidenced in studies by Edwards (1993), A. Giles and

Williams (2000), Cooper and Helpman (2004), Hye et al. (2013), Li et al. (2025), and Adelakun et al. (2025). According to Adelakun et al. (2025), most of the empirical focus has been directed towards developing economies. For instance, Jung and Marshall (1985) analysed 37 developing countries using the Granger causality framework to examine the export–growth nexus. Their findings did not provide definitive support for the export-led growth hypothesis. Similarly, Awokuse (2007) investigated Bulgaria, the Czech Republic, and Poland through causal analysis and a production function approach, employing a vector error correction model (VECM). The results indicated bidirectional causality between exports and growth in Bulgaria, while imports emerged as a key driver of growth in the Czech Republic and Poland. Sarkar (2008), examining 51 countries, further confirmed a positive association between trade openness and economic growth in middle-income economies. Collectively, studies such as Edwards (1993), Li et al. (2025), and Adelakun et al. (2025) provide mixed empirical evidence supporting both export-led and import-led growth mechanisms.

As noted by Hye and Lau (2015), the majority of research on exports has concentrated on developing economies. Jung and Marshall (1985) represent one of the earliest empirical contributions in this field, utilising data from over 30 developing countries and applying the Granger causality approach. While their analysis revealed statistical associations between exports and growth in certain cases, it did not confirm a universal export-led growth pattern, suggesting that exports alone cannot consistently drive economic growth across developing economies. Abhayaratne (1996) highlights substantial cross-country variation in the validity of the export-led growth hypothesis, with supporting evidence found only in Bangladesh, Pakistan, and Nepal, and no significant confirmation in India and Sri Lanka. Their findings emphasise the importance of imports, particularly raw materials and technology, in sustaining productivity and long-term growth, thereby indicating that a sole focus on exports may lead to an incomplete understanding of economic development dynamics.

For Kazakhstan, Akhter et al. (2022) demonstrate that the benefits of trade openness are contingent upon the country's capacity to leverage trade for technological advancement, diversification, and value addition rather than mere export expansion. Their findings identify institutional weaknesses, governance challenges, and inefficient economic structures as key constraints on development, while also suggesting that excessive imports may offset export gains and negatively affect overall economic outcomes. In a similar vein, Wani (2022) reports a negative relationship between trade openness and economic growth in the Indian context, whereas Sein and Sah (2025) emphasise that improving trade infrastructure and reducing reliance on a narrow set of trading partners can enhance export competitiveness and global integration. Contrastingly, Ulaşan (2015) finds no statistically significant relationship between reductions in trade barriers and economic growth, reinforcing the ongoing debate. Ondaye (2023) similarly notes that the relationship between international trade integration and growth remains inconclusive. Berthélemy (2005) argues that the benefits of trade openness depend on

export heterogeneity, while Capolupo and Celi (2008) suggest that developing and transition economies may experience productivity gains through technology transfer facilitated by trade.

In contemporary contexts, Demertzis and Fiorito (2026) emphasise that firms increasingly depend on imported inputs such as machinery, components, and logistical systems to remain competitive in global markets. Disruptions in imports can therefore adversely affect export capacity, highlighting the interdependence between imports and exports. Consequently, as Civan et al. (2013) argues, effective foreign trade policy has become a critical driver of national development. This is reflected in countries such as Turkey and Kazakhstan, where foreign policy has shifted from a security-oriented approach towards strengthening trade networks and diplomatic channels to support capital and technology flows, thereby translating geopolitical influence into economic gains. Empirical evidence from Adelakun et al. (2025), based on 22 EAC and SADC countries between 1990 and 2022, indicates that trade liberalisation and participation in regional agreements such as the African Continental Free Trade Area have contributed to structural economic changes. Using a Cobb-Douglas production framework estimated via the System Generalised Method of Moments, their findings reveal a bidirectional relationship between exports and GDP, suggesting a feedback mechanism where economic growth stimulates exports and vice versa. However, these benefits depend on institutional strength, diversification, and innovation capacity.

Further support is provided by Li et al. (2025), who argue that combining export-led strategies with digitalisation enhances technological upgrading, improves export structures, and strengthens innovation in developing economies. Earlier studies, including Darrat (1987), McCarville and Nnadozie (1995), and Darrat et al. (2000), similarly confirm a positive relationship between exports and growth across both advanced and emerging economies. Halicioglu (2007) examines the relationship between industrial production, exports, and terms of trade using quarterly data from 1980 to 2005. Applying unit root tests and a VECM, the study identifies both short-run and long-run relationships, concluding that exports significantly influence industrial production, particularly in the long term. However, contrasting evidence is provided by Bozatli et al. (2023), who find that Turkey's export-oriented industrialisation strategy has not achieved its intended growth outcomes, highlighting the need for policy reassessment. These differing findings suggest that the effectiveness of export-led growth strategies varies across time periods and policy environments.

In the context of import-led growth, Lusaya (2019) demonstrates a long-term relationship between imports and economic development, using Granger causality and Johansen cointegration techniques. The study finds that imports play a unidirectional role in promoting growth, particularly through access to foreign capital and technology, and that trade liberalisation enhances this process. Similarly, Abual-Foul (2004) finds that exports drive output in Jordan, supporting the export-led growth hypothesis through

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VAR and ECM analysis, while also highlighting the role of institutional support in stimulating export performance. Building on this, studies such as Jin and Shih (1995) and Shan and Sun (1998) show that export growth drives economic expansion in newly industrialised Asian economies using VAR models. Islam (1998) further confirms that many Asian economies rely on export-led growth through VECM analysis, demonstrating strong interconnections between trade variables and economic performance. Although studies like McCarville and Nnadozie (1995), Abhayaratne (1996), Li et al. (2025), and Adelakun et al. (2025) support export-led growth, other research, including Awokuse (2007) and Halicioglu (2007), reveals heterogeneous results, ranging from unidirectional to bidirectional causality.

Additional evidence from Hussain et al. (2026), using the autoregressive distributed lag (ARDL) approach, confirms a long-run relationship between exports and economic growth in Pakistan, reinforcing the export-led growth hypothesis. However, more recent studies by Awokuse (2008), Lusaya (2019), Panta et al. (2022), and Bozatli et al. (2023) suggest that import-led growth may offer a more accurate explanation of economic expansion in certain contexts, aligning with the findings of this study on Kazakhstan. Overall, Adelakun et al. (2025) further propose that the relationship between exports and economic growth is reciprocal, reflecting a complex and dynamic interaction between trade and economic performance.

METHODOLOGY

A linkage between exports, imports, and economic growth, grounded in both theoretical perspectives and empirical findings, may take several forms, including:

- Export-induced growth (EIG) or growth-driven export (GDE)
- Import-induced growth (IIG) or growth-driven import (GDI)
- A reciprocal relationship between the variables

Robust export performance can contribute to the expansion of economic prosperity. However, within the ILG framework, as discussed by Panta et al. (2022), Bozatli et al. (2023), and Lusaya (2019), imports are also identified as having a positive influence on domestic consumption. These studies emphasise that imports play an essential role in enhancing welfare in developing and emerging economies. Moreover, imports provide domestic firms with access to advanced technologies and intermediate goods, serving as a channel for transferring foreign knowledge and research and development (R&D) capabilities. This mechanism helps reduce technological disparities and supports long-term economic growth, as highlighted by Coe et al. (2009).

In this study, the Granger causality technique, embedded within a cointegration and error correction framework, is employed to assess the integration properties of the data and to investigate the relationship between exports and other macroeconomic variables

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in Kazakhstan. The variables considered include import growth (IMP), export growth (EXP), and gross domestic product (GDP), all measured in real terms. Building on the work of Islam (1998) and Hye and Lau (2015), the analysis tests the export-induced growth (EIG), growth-driven exports (GDE), import-induced growth (IIG), and growth-driven imports (GDI) hypotheses by examining the causal relationships between GDP and exports, as specified in Equations 1 and 2, as well as the import-induced growth (IIG) and growth-driven import (GDI) assumptions outlined in Equations 3 and 4.

$$GDPt = \alpha 0 + \alpha 1 EXP + \psi t \quad (1)$$
$$EXPt = \beta 1 + \beta 1 GDPt + \nu t \quad (2)$$
$$GDPt = \theta 0 + \theta 1 IMPt + \psi t \quad (3)$$
$$IMPt = \varphi + \varphi GDP + \nu \quad (4)$$

To examine the relationship between GDP, EXP, and IMP in Kazakhstan, the model is specified as follows:

$$GDPt = A0\, EXP_t^{\alpha 1} IMP_t^{\alpha 2} e^{\varepsilon t} \quad (5)$$

The logarithmic form of the relationship can be expressed as follows. According to Phillips and Perron (1988), the unit root test accounts for higher-order serial correlation within a time series. Accordingly, the Phillips–Perron (PP) tests are implemented by estimating the following regression (Equation 5).

$$\ln(GDP_t) = \alpha_0 + \alpha_1 \ln(EXP_t) + \alpha_2 \ln(IMP_t) + \varepsilon_t \quad (6)$$

Where $\alpha 0 = \ln(A0)$;

$lnGDP_t$- are the first differences of the series of GDP;
a_0 , a_1,a_2- are parameters;
t stands for time;
ε_t is a white noise disturbance term.

The null and alternative hypotheses are specified as H0: c = 0 and H1: c < 0. The ADF framework is employed to evaluate the stationarity properties of the variables under consideration. From this point onwards, if the residuals are found to be stationary, the variables are regarded as cointegrated, indicating the presence of a long-run equilibrium relationship among them. However, estimating a VAR model using differenced variables in the presence of cointegration may lead to the loss of important long-term information and potentially distort the results. To address this limitation, an error correction term (ECT) is incorporated into the VAR framework, resulting in a VECM, which enables the simultaneous capture of both short-run dynamics and long-run equilibrium relationships. The augmented Granger causality approach, combined with the error correction mechanism, is therefore specified within a multivariate Vector Error Correction (VEC) model of the following form:

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$$\begin{bmatrix} GDP_t \\ EXP_t \\ IMP_t \end{bmatrix} = \begin{bmatrix} C_1 \\ C_2 \\ C_3 \end{bmatrix} + \sum_{k=1}^{p} \begin{bmatrix} \beta_{11k}\beta_{12k}\beta_{13k} \\ \beta_{21k}\beta_{22k}\beta_{23k} \\ \beta_{31k}\beta_{32k}\beta_{33k} \end{bmatrix} \begin{bmatrix} \Delta \ln GDP_{t-k} \\ \Delta \ln EXP_{t-k} \\ \Delta \ln IMP_{t-k} \end{bmatrix} + \begin{bmatrix} \lambda_1 \\ \lambda_2 \\ \lambda_3 \end{bmatrix} ECM_{t-1} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \quad (7)$$

Where i= 1,2…n; t=p+1, p+2…T;

C's, β's, and λ's are parameters to be estimated;

Δ denotes first differences, and ECMt-1 indicates the period (one) lagged error correction term for ECM models derived from the cointegration vector.

Within the VECM framework, all variables are treated as endogenous, and the F-test is used to determine the direction of causal relationships among them. For the Kazakhstani case, the VAR model can be expressed in compact vector notation as:

$$y_t = c + A_1 y_{t-1} + \varepsilon_t, \quad (8)$$

Where,

y_t – is 3×1- stationary endogenous variables at time t
c- is a 3×1 - constant intercepts
A – 3×1 - matrix of autoregressive coefficients for a first lag
ε_t- 3×1 - white noise error terms

So, the expanded system can be rewritten as follows:

$$\begin{bmatrix} EXP_t \\ IMP_t \\ \Delta GDP_t \end{bmatrix} = \begin{bmatrix} c_1 \\ c_2 \\ c_3 \end{bmatrix} + \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} \begin{bmatrix} EXP_{t-1} \\ IMP_{t-1} \\ \Delta GDP_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \\ \varepsilon_{3,t} \end{bmatrix} \quad (9)$$

The calculation is performed by subtracting the previous value from the current value, and it is expressed as follows:

$$\Delta GDP = GDP_t - GDP_{t-1} \quad (10)$$

This transformation eliminates the stochastic trend (unit root) responsible for non-stationarity. Accordingly, if a variable becomes stationary after first differencing, it is classified as integrated of order one.

Following the Engle–Granger approach (Engle & Granger, 1987), when two variables contain stochastic trends, their long-run association can be represented through an error correction model (ECM). In this framework, the lagged residual from the non-stationary regression acts as the error correction term. Under such conditions, cointegration signifies the existence of a stable long-term equilibrium relationship between the

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variables. Annual data on Kazakhstan's real GDP are obtained from the United Nations Development Programme (UNDP) website (undp.org).

FINDINGS AND DISCUSSION

A univariate analysis is carried out to examine the stationarity characteristics of the time series data. The real values of the variables are tested for stationarity using the ADF t-tests (Dickey & Fuller, 1979), and they are found to be stationary at the 5% significance level, thereby allowing for the application of cointegration tests on the variables. To further assess the stationarity properties of the time series data, a one-dimensional approach is implemented. The real values of the variables are evaluated using ADF t-tests (Dickey & Fuller, 1979), and stationarity is confirmed at the 5% significance level, which permits the execution of cointegration analysis (Table 1).

Table 1: ADF Unit Root Test Results*

Variables	ADF Statistics Results	Critical Value (5%)	P-Value	
GDP	-2.7111	-2.9605	0.072139	Non-Stationary
EXPORT	-4.8802	-2.9605	0.000038	Stationary
IMPORT	-3.5249	2.9641	0.007371	Stationary

Note: *No interception, or trend in ADF regress lags
Source: The author's calculation

According to the ADF test results, export annual average growth is stationary at the level, as indicated by the p-value (0.000038), which is well below the 0.05 threshold. Similarly, import annual average growth is also stationary, with a p-value (0.007371) below 0.05, confirming stationarity at the given level. In contrast, the economic growth indicator reports a p-value of 0.072139, which exceeds the 5% significance level; therefore, the null hypothesis of non-stationarity cannot be rejected, as shown in Table 1. Since the ADF test results indicate that export and import growth variables are stationary while GDP is non-stationary, estimating a standard VAR model in levels is not appropriate. To address this, the first difference of GDP is considered. This also reflects the notion that the impact of import and export variables on economic growth may operate with lagged effects. Accordingly, the first difference of economic growth (ΔGDP), representing exponential change, is utilised in the subsequent VAR model to satisfy the stationarity requirement necessary for standard causality analysis.

Table 2: ADF Stationarity Test Analysis for GDP

	Statistics of ADF	P-Value	5 % Critical Value Result	
Δ GDP (First Difference)	-4.5484	0.00016	-2.9720	Stationary

Source: The authors' calculation

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Since the p-value is 0.00016, it is considerably lower than the 0.05 significance threshold. In addition, the ADF statistic, reported as -4.5484, is more negative than the 5% critical value of -2.9720. These results provide sufficient evidence to reject the null hypothesis of a unit root. As all three variables under consideration are now stationary, it is appropriate to employ econometric techniques such as VAR, Granger causality tests, and Engle–Granger cointegration analysis. The existence of cointegration relationships supports the suitability of the ECM specification. Furthermore, the ECM residuals satisfy the white noise assumption. In analysing the dynamic relationships among export growth, import growth, and GDP growth in Kazakhstan, the three variables are evaluated using annual data. Initially, Wald tests for Granger causality are conducted within the ECM-based vector specification. Table 3 presents the results of the Granger causality tests derived from the ECM framework. Each column corresponds to the ECM results for one of the three variables in the system. The Granger causality outcomes are reported as F-statistics, with corresponding probabilities in parentheses, representing the joint significance of lagged independent variables in the ECM equations. The final column reports t-statistics for the error correction term.

Table 3: Granger Causality Test Results

Dependent Variable	ΔGDP	EXP	IMP	Results
ΔGDP	-	0.4021 (0.5314)	5.1075* (0.0321)	IMP→GDP are significant for GDP
EXP	0.3573 (0.5550)	-	0.0467 (0.8306)	-
IMP	1.2687 (0.2699)	2.5216 (0.1239)	-	-

Note: *Indicate that a test statistic is significant at the 5% level of significance
Source: Authors' calculation

The results for Kazakhstan indicate a unidirectional causal relationship running from import growth to lagged economic growth. No Granger causality is observed from export growth to lagged GDP growth; however, a statistically significant relationship is identified from import growth to GDP growth in first differences ($p = 0.0321$) in the long run. Furthermore, there is no empirical support for the export-led growth (ELG) hypothesis, as export growth does not Granger-cause GDP acceleration ($p = 0.5314$). The findings also reveal no feedback effect from GDP to trade variables within the short-run model, suggesting that economic growth is primarily driven by import inflows rather than acting as a determinant of trade volumes in the immediate term. Overall, the Granger causality results emphasise that import growth plays a central role in Kazakhstan's economic development, supporting the ILG framework. This aligns with Sultankhanova and Abdulla (2022), who identify imports as the second most significant positive contributor to GDP. Additionally, Salykova (2012) and Kalyuzhnova et al. (2004) note that Kazakhstan's export structure is heavily influenced by substantial net oil exports and comparatively smaller but still significant gas exports.

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In this context, Kazakhstan, as a major oil exporter, relies on imports of capital goods, advanced technologies, and industrial equipment to support its economic structure. Moreover, Sutbayeva et al. (2024) find that trade openness and foreign direct investment are positively associated with economic growth, whereas natural resource abundance does not exert a significant effect on economic growth. Based on these insights, the findings suggest that Kazakhstan's development trajectory is not solely defined by its role as an oil exporter, but rather by its capacity to effectively utilise foreign exchange inflows to enhance and digitalise its domestic economic structure.

CONCLUSION

Over the past 25 years, Kazakhstan's financial structure has been strongly influenced by rising global commodity prices, particularly in the oil and gas sectors. While these conditions supported GDP growth of 9–10% up to 2008, the subsequent global financial crisis exposed the fragility of a resource-dependent growth model. Although conventional perspectives attribute Kazakhstan's economic performance primarily to trade revenues, this study provides a more rigorous quantitative assessment of the underlying growth drivers. Using trade indicators and VAR techniques, it examines the causal relationships between exports, imports, and economic growth. The Granger causality results show no evidence supporting the ELG hypothesis ($p = 0.5314$), while providing strong support for the ILG hypothesis, with a significant unidirectional causal link from import growth to economic growth ($p = 0.0321$). Given the mixed findings in the existing literature regarding the trade–growth nexus, this study applies cointegration analysis, an error correction framework, and causality testing to evaluate both ELG and ILG hypotheses using Kazakhstan's time series data. The results indicate that economic growth is not driven by export volumes alone, but rather by the country's ability to channel trade revenues into imports of capital, technology, and innovation inputs. In this context, imports act as the primary mechanism for technological transfer and industrial upgrading.

Although resource exports provide essential foreign exchange, the ILG framework highlights that sustainable growth depends on transforming these inflows into domestic development through strategic imports. For policymakers, this underscores the need for stable exchange rates and effective trade policies that facilitate the import of advanced technologies and capital goods. Simply increasing exports is insufficient unless it supports productive imports that enhance capacity and innovation. Overall, the findings suggest that despite Kazakhstan's resource-rich economy and the significant contribution of exports to GDP, ILG is becoming increasingly relevant. As the country modernises its industrial base, prioritising strategic imports over reliance on raw material exports offers a more effective path toward long-term, diversified, and sustainable economic growth. Consequently, trade policy should focus not only on export expansion but also on enabling access to the technological inputs required for structural transformation.

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