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Revisiting the FDI -Growth Nexus: Evidence from Kazakhstan

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Abstract

Since gaining independence from the Soviet Union in 1991, the Republic of Kazakhstan has benefited greatly from foreign direct investment (FDI) in comparison to other Commonwealth of Independent States nations. This study looks into how FDI affects Kazakhstan's economic growth from 1994-2024. When the gross domestic product is the regressive variable, it incorporates investment, foreign trade, labour force participation rate, inflation, and natural resources as explanatory constructs. Data stationarity is tested using the Phillips and Perron (1988) and modified Dickey and Fuller (1981) methods. The Autoregressive Distributed Lag (ARDL) model is justified by the mixed order of integration I (0) and I (1). The bound test demonstrates a lasting relationship between the relevant variables. The findings show that FDI, GFCF and trade openness all have a favourable long-term effect on economic growth. Natural resource rents on the other hand continue to be statistically negligible, while the labour force participation rate shows a strong negative relationship with economic growth, indicating structural labour market difficulties. Only Capital Formation, labour force participation rate and trade openness have a major short-term impact on economic growth. The optimal lag selection process prevents the short-term effects of FDI, inflation and natural resource rents from being seen. The results indicate that in order to achieve sustainable long-term economic growth in Kazakhstan, it is imperative to improve institutional quality, diversify the economy and draw in FDI that boosts productivity.

Keywords: foreign direct investment; economic growth; Kazakhstan; stationarity; auto–regressive distributed lag model (ARDL)

JEL Classification: F21; F43; C22; O47; P28

1. Introduction

Economic growth is a goal recognized by all nations (World Bank, 2021). The process of continuously increasing an economy's productive capacity in an attempt to produce consistently rising levels of wealth and national output is known as economic growth (Chirwa & Odhiambo). Solow (1956) contends that labour, capital accumulation and technological advancement are the main forces behind long-term economic growth in the neoclassical growth model, whereas Paul Romer (1986) and Robert E. Lucas Jr. (1988) developed endogenous

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growth theory, which emphasizes the role of knowledge, innovation and human capital in maintaining growth.

The empirical research builds on these theories has identified a number of factors that influence economic growth such as foreign direct investment (FDI), human capital, trade openness, financial development, institutional quality, natural resources and domestic investment. Among these FDI has garnered significant attention due to its ability to supplement domestic capital, facilitate technology transfer, improve managerial expertise, boost productivity through spillover effect and strengthen integration into international markets (John H. Dunning, 1993; Borensztein, De Gregorio, and Lee (1998). Lagendijk and Hendrikx (2009) define FDI as the transfer of ownership and productive assets to foreign organizations allowing businesses to take advantage of location-specific advantages and exploit their special capabilities.

In recent decades, FDI has been a key component of global economic integration supporting economic growth in both developed and developing nations. Particularly in emerging nations the inflow of foreign capital has been marketed as a catalyst for economic expansion, job creation and technological transfer. In the face of fundamental limitations including low domestic savings, poor infrastructure and shaky institutional frameworks developing nations confront tremendous obstacles in their quest for quick and sustainable economic growth. In this situation FDI becomes a crucial source of outside funding that can enhance domestic resources and promote economic growth Governments have been attempting to draw in FDI since the early 1990s in order to boost economic activity, increase productivity and improve the general investment climate. Now Understanding FDI's effects on economic growth has become crucial for research, policy discussions and international relations as FDI flows have expanded dramatically. Although most people agree that FDI has a favourable effect on growth, economists and policymakers continue to disagree about how much FDI actually contributes.

According to a number of studies (Borensztein *et al*., 1998; Alfaro, 2003) FDI can boost growth by promoting capital accumulation, knowledge spillovers and improved market efficiency. However other academics contend that a number of host country variables including institutional quality, governance and the domestic economy's capacity for absorption affect the relationship between FDI and economic growth (Blomström *et al*., 2001; Neumayer & Spess, 2005). This comprehensive viewpoint implies that FDI is not a one-size-fits-all answer and that the host nation's larger institutional and economic framework affects its outcomes.

However, the contribution of FDI to economic growth is still up for question, with empirical research reporting mixed, positive and negative results based on absorptive capacity and country-specific features. These variations imply that determining the true impact of FDI to economic growth requires country-specific analysis. In this regard Kazakhstan offers a compelling justification for further research. Kazakhstan, the largest economy in Central Asia has drawn significant foreign direct investment since obtaining independence in 1991 especially in the energy and extractive industries making it a suitable case study to investigate the connection between FDI and economic growth.

The present study aims to re-examine the relationship between FDI and Economic growth in Kazakhstan using contemporary data and the ARDL approach despite the country's success in luring FDI, whether these inflows have resulted in sustained economic growth remains an open empirical question. Given the current state of global investment where FDI flows have seen significant fluctuations, this issue has become even more pertinent. According to the United Nations Conference on Trade and Development's (UNCTAD) annual World Investment Report 2025, Global FDI in flows have decreased by 11% to $1.5 trillion. The decline was especially acute in landlocked and poor nations. Amid this challenging environment, Kazakhstan has continued to be Central Asia's top beneficiary of FDI aided by its advantageous location, ongoing economic reforms, programs for digital transformation, and laws intended to stimulate industrial development.

Since achieving independence, Kazakhstan has drawn over $151 billion in net FDI, according to UNCTAD. Turkmenistan ($44 billion), Uzbekistan ($16 billion), Tajikistan and Kyrgyzstan (around $4 billion apiece) come next. Kazakhstan received $15.7 billion in new project investments in 2024, making up 63% of all foreign investment in new projects in Northern and Central Asia, an 88% increase over 2023, according to ESCAP. Kazakhstan's success in luring international investment makes it a crucial case study for determining if FDI has successfully aided in long-term economic growth. The theoretical and empirical literature supporting this relationship is reviewed in the section that follows.

2. Literature review

FDI is a crucial component of an effective development plan according to policymakers in both developed and developing nations. For example, the European Commission claims that economic development and competitiveness are fuelled by FDI. In a same vein, the World Bank stated that FDI was essential to crisis recovery during the COVID-19 pandemic (Pazarbasioglu 2020).

Penner (1966) and Noorzoy (1979) were two of the first scholars to investigate the connection between foreign direct investment (FDI) and growth. They both used a Solow neoclassical growth framework (Solow 1956) to contend that FDI directly causes growth by supplying funds for capital accumulation that support domestic investment.

Das (1987), on the other hand, used aspects of contemporary growth theories (Lucas 1988; Romer 1990), such as the endogenized process of knowledge accumulation to propose that FDI inflows not only stimulate capital accumulation in the host economy but also produce positive externalities that help domestic firms by transferring efficient business practices and foreign technology. Additionally, it has been discovered that FDI encourages the migration of skilled professionals who can impart knowledge to domestic workers. These so-called "spillover effects" contribute to the knowledge base of the host economy and ultimately result in growth (de Mello, 1999 & Barrell and Pain, 1999). This is particularly true for emerging economies, which stand to benefit more from these technological and knowledge spillovers because they are by nature less industrialized and have less educated labour forces (Campos and Kinoshita, 2002).

The connection between FDI and economic growth has been intensively explored in the literature, with contradictory findings about the direction and strength of this association. Early research revealed a positive correlation between FDI and growth, particularly in developing countries. More recent research has shown that the relationship between FDI and growth is not always clear-cut. The host nation's absorptive capacity that is its capacity to make efficient use of foreign capital and technology often determines the benefits of FDI. FDI has been a significant force behind industrialization and economic change in various areas, especially in East Asia. For example, nations like China, South Korea, and Singapore have effectively used FDI to progress technology, generate employment, and grow their export industries (Li & Liu, 2005). Conversely, the advantages of FDI have been less evident in many African and Latin American nations and some research indicates that FDI has not made a substantial contribution to growth (Aitken & Harrison, 1999).

These disparate results among nations showed that FDI's growth effects cannot be broadly applied necessitating empirical confirmation in many economic circumstances. As a result, the empirical data on the connection between FDI and economic growth is reviewed in the part that follows. Borenstein, De Gregorio and Lee (1998) used data on FDI flows from industrial countries to 69 developing countries over the past 20 years to examined the impact of FDI on economic growth in a cross-country regression framework. The findings imply that FDI plays a significant role in knowledge transfer, making a comparatively greater contribution to growth than local investment. However, FDI's increased productivity is only valid if the host nation possessed a minimal threshold of human capital. Therefore, FDI only promotes economic growth when the host economy has enough capacity to absorb cutting-edge innovations.

Frimpong (2006) investigated the long-term effects of trade and foreign direct investment on Ghana's economic expansion. The paper applies the bounds testing (ARDL) method to cointegration and employs an augmented aggregate production function (APF) growth model. The study's data spans from 1970 to 2002. The findings showed that FDI had a negative effect on growth, which is in line with another earlier research. However, it was discovered that trade had a major impact on growth. The widely held notion that FDI typically boosts economic growth in developing nations was contested by Herzer and Klasen (2008). They re-examined the FDI-led growth hypothesis for 28 developing nations utilizing cointegration techniques on a country-by-country basis, addressing the shortcomings of the previous literature. The study concluded that FDI has neither a short-term nor a long-term impact on growth in the great majority of nations, in fact, not a single nation has a positive, unidirectional long-term effect from FDI to GDP. Additionally, the findings had showed that there is no discernible correlation between the amount of per capita income and the growth impact of FDI.

Osuji (2015) looked into the connection between Nigeria's economic expansion and FDI. Model estimate for the years 1981–2013 was done using ARDL model and the bounds testing approach. The result clearly demonstrated that FDI and economic growth have a long-term (cointegrating) link. FDI has a minor but negligible impact on GDP in the short term and a minor but negligible impact in the long term. Additionally, it suggested that using economic policy as a vehicle to diversify FDI from the oil industry to the manufacturing and agricultural

sectors, where growth would more readily convert into development and there is a significant potential for job creation.

Iamsiraroj (2016) used a simultaneous system of equations approach to examine the relationships between FDI and growth utilizing 124 cross-country data from 1971 to 2010. The estimation's findings show that FDI's total impacts are positively correlated with growth and vice versa. Other important factors that influence FDI include labour force participation, trade openness, and economic freedom, all of which further boost income growth. Cheong WTLM and Junjun (2018) used a panel data approach to evaluate the impact of foreign direct investment (FDI) on the economic growth of nine (9) West African nations between 1995 and 2015. Consequently, FDI has a favourable impact on economic growth in West African nations and is statistically significant. Additionally, in order to prevent FDI from having a detrimental impact on the GDP of West African nations, the government must promote and lead it to engage in more productive activities. The impact of FDI on Pakistan's economic growth is examined by Jehangir, Lee and Park (2020). The study also looked at how different factors have contributed to the expansion of the nation's economy. Using ARDL model, this study looked at the long-term and short-term relationships between the variables from 1974 to 2018. According to the study, long-term economic growth is positively impacted by FDI, gross fixed capital formation, and labour force participation, whereas military spending has a negative impact. FDI, military spending and labour force participation were found to have favourable effects in the short term.

Almalik, Shaheen, and Ahmed (2024) examined the relationship between FDI and economic development in G20 nations. The study used annual panel data from 19 nations between 2001 and 2022. The study incorporates control variables such as currency rates, trade balance, inflation, government effectiveness and gross fixed capital formation in addition to FDI as the primary independent variable. Johansen's cointegration method and a vector error correction model are used to evaluate the relationship between economic growth and FDI. FDI had a positive and statistically significant impact on the economic growth of G20 nations, according to the results of every econometric model. Kaur and Wadhawan (2020) attempted to establish a causal relationship between FDI and economic growth. The information was obtained from a variety of secondary sources.

To determine the link between the variables, regression analysis has been employed. The main conclusions of the study unequivocally showed that the change in FDI has a moderately positive link with economic development. Shah, Saunders and Kollydas (2026) in their study explored the varied effects of technological gaps, human capital, and institutional quality on the link between FDI and growth using panel data from 46 industrialized and developing nations between 1996 and 2023. It employs a multi-method and robust empirical approach that included panel threshold regressions, system GMM, FE-2SLS, high-dimensional fixed effects and two-way fixed effects. The results demonstrated that FDI has conditional rather than uniform growth effects. According to the linear panel estimates FDI continues to be positive and considerable in developing nations but does not clearly show a direct growth effect in rich countries. The impact of FDI in developing nations increases significantly as human capital surpasses 9.35 years of education. Although the pattern varies among nation groups and is not

monotonic, threshold effects are also produced by institutional quality and the technological gap. In the end, this study argues that if foreign investment is to be most successful, governments should build institutional quality, human capital and technology capabilities rather than relying solely on FDI to spur economic growth.

2.1 Evidence from Kazakhstan

Lee, Baimukhamedova and Akhmetova (2010) examined how FDI inflows, exchange rates and a developing nation's economic growth are related as well as how these factors affect the country's main economic activities. A multivariate regression model with weighted least squares estimates were used to evaluate Kazakhstan's macroeconomic activity data during 1997–2006.

The findings show that FDI has a negligible or statistically insignificant effect on Kazakhstan's GDP growth. The study makes the case that resource-seeking FDI has little impact on boosting emerging nations' economies. In conclusion, this research recommends that Kazakhstani policymakers take into account the strategic objectives of foreign direct investment in order to optimize its economic advantages. Simple regression analyses were utilized by Waikar, Jepbarova, Lee, Gardner and Johnson (2011) to ascertain the effect of FDI on GDP, per capita income and specific economic sectors. According to the assessments, FDI generally has a moderately beneficial impact on Kazakhstan's per-capita income and economic growth. The energy sector receives the greatest portion of FDI.

The study came to the conclusion that while FDI might not be sufficient to support Kazakhstan's economy's sustainable growth, their dedication to more economic freedom should help the country's economy. Fariza, Lee and Sharipova (2015) examined the connection between economic growth and FDI as a component of Kazakhstan's economic diversification. The study looked at how the manufacturing and natural resource sectors affected economic development between 1994 and 2013 in order to analyse economic structural change as a transition economy in countries focused on natural resources. Gross Domestic Product, Human Development Index, Gross Capital Formation, and Foreign Direct Investment were all incorporated in the modified version of the basic multiple regression model. According to the study, GDP, FDI, and gross capital formation are significantly correlated. However, there is no correlation between GDP and the Human Development Index. FDI into the manufacturing and commodities sectors, however, has different outcomes and has less of an impact on GDP.

Syzdykova and Azretbergenova (2021) investigated how foreign direct investments affected Kazakhstan's economic expansion. Using quarterly data on GDP, gross fixed capital formation, governmental spending, openness, and foreign investments from 2005 to 2020, the association between foreign investments and economic growth in Kazakhstan has been examined. The investigation began with the Augmented Dickey-Fuller (ADF) unit root test and concluded with the Granger causality test, or VAR analysis. The Granger causality test results indicate that openness is the sole factor contributing to Kazakhstan's economic growth. The causation test did not yield any instances of foreign investment impacting growth. However, the impact of foreign investments on economic growth was not statistically significant.

The goal of Rakhmatullayeva, Khajiyeva and Abduraimov (2021) is to provide an empirical examination of how foreign direct investment (FDI) affected Kazakhstan's economy between 1991 and 2020, with a focus on important economic growth metrics like GDP. The study analysed and assessed the effects of FDI on Kazakhstan's economy using the causal research technique and popular econometric models, such as linear regression and vector autoregression (VAR). The study's findings show that exports and FDI have a statistically significant effect on Kazakhstan's GDP, whereas exports and GDP have a favourable effect on FDI. The resource curse theory and the impact of foreign direct investment on Kazakhstan's economic growth are examined by Samambet (2024). The ARDL model and Toda-Yamamoto causality techniques were used in this study which spans the years from 1990 to 2022. There are long-term equilibria between per capita GDP and the predictors, according to the Bounds cointegration results. The results show that oil rents have a major effect on economic growth, refuting the resource curse theory and pointing to a resource bonanza. In sharp contrast, despite the existence of a causal relationship, the effect of FDI on Kazakhstan's economic growth is determined to be negligible. The results disprove the idea that FDI crowds out indigenous investment in Kazakhstan.

There is still disagreement on FDI's contribution to Kazakhstan's economic development despite extensive studies. The conflicting findings largely reflect differences in data periods, model assumptions and explanatory factors. The conflicting results imply that the FDI–growth relationship is still unclear. Furthermore, in order to investigate the short-term and long-term dynamics of the FDI–growth link, previous research has mostly relied on traditional econometric techniques like OLS, multiple regression, and VAR models, with little use of the ARDL Bounds Testing approach. To give more solid data on the contribution of FDI to Kazakhstan's economic growth, this methodological gap highlights the need for applying the ARDL Bounds Testing approach. Furthermore, a large portion of the information that is now accessible is based on older datasets which emphasizes the necessity for updated empirical research using current data until 2024. Thus, the current study uses the ARDL Bounds Testing method to present new findings regarding the relationship between FDI and growth in Kazakhstan.

3. Methodology

3.1 Data source and variable description

Annual time-series data for Kazakhstan from 1994 to 2024 are used in this study. The World Bank's World Development Indicators (WDI) database, which offers trustworthy and globally comparable macroeconomic indicators is the source of the data. Using a single dependent variable and a number of explanatory variables, the study investigates the effect of FDI on economic growth.

GDP growth (GDPG), which is expressed as the gross domestic product's annual percentage growth rate, is the dependent variable. GDPG is the market value of all finished goods and services produced or generated inside an economy's domestic territory during a period of time, often a year (Ahuja, 2011). Foreign Direct Investment (FDI), expressed as net FDI inflows as a proportion of GDP is the primary explanatory variable. The model also includes a number of control variables to prevent omitted variable bias.

Gross fixed capital formation (GFCF), serves as a stand-in for domestic investment. Both neoclassical and endogenous growth models acknowledge capital or investment as the primary driver of economic growth (Petrakos *et al*., 2007). The Consumer Price Index (CPI), which tracks shifts in the average cost of goods and services consumed by households, is used to calculate inflation (INF). CPI has been widely employed as an explanatory variable in empirical studies looking at the connection between inflation and economic growth, and it is generally considered a sign of macroeconomic stability (Mohaddes & Raissi, 2014; Rahman *et al*., 2021).

Labor force participation rate (LFPR) is measured as the percentage of a nation's entire population that is 15 years of age or older and contributes work for the production of goods and services (GDP) over a specific time period. Trade (TRD) is the total of all imports and exports as a percentage of GDP. It serves as a stand-in for trade openness. Natural resources are measured as Total natural resource rent (TNR) as a percentage of GDP. The overall rents from natural resources include those from coal, oil, natural gas, minerals and forests.

The variables utilized in the studies are chosen based on the availability of data and their significance or contribution to growth (based on the literature)

Table 1: Description of Variable

Variable	Proxy	Measurement	Expected Sign	Source
GDPG	Economic Growth	Annual GDP Growth (%)	Dependent Variable	WDI
FDI	Foreign Direct Investment	Net Inflows (% of GDP)	+	WDI
GFCF	Domestic Investment	Gross Fixed Capital Formation (% of GDP)	+	WDI
INF	Macroeconomic Stability	Consumer Price Index (Annual %)	-	WDI
LFPR	Labour Market	Labour Force Participation Rate (%)	+	WDI
TRD	Trade Openness	Trade (% of GDP)	+	WDI
TNR	Natural Resources	Total Natural Resource Rents (% of GDP)	+/-	WDI

Source: Authors own compilation.

3.2 Model Specification

The functional definition of our model is supported by the research done by Solow (1956), Borensztein *et al.* (1998) and Alfaro (2003) based on the literature on the effect of FDI on economic growth. These studies look at how FDI and economic growth are related. Since FDI is regarded as a growth engine in the modern era, it is theoretically expected that FDI will positively affect economic growth through spillover effects. As a result, the current study examines at how FDI affects economic growth while accounting for other potential growth-influencing variables. The functional relationship can be expressed as:

$$Growth = f\ (FDI, \text{GFCF, INF, LFPR, TNR, TRD} \quad (1)$$

The primary econometric model in this study can be represented as a linear equation by incorporating control variables:

$$GDPG_t = \beta 0 + \beta 1 FDI_t + \beta 2 GFCF_t + \beta 3 INF_t + \beta 4 LFPR_t + \beta 5 TNR_t + \beta 6 TRD_t + \mu_t \quad (2)$$

where: $GDPGt$ represent the Gross domestic product in period t; FDI_t is the foreign direct investment in period t; $GFCF_t$ is the gross fixed capital formation as a measure of domestic investment in period t; $INFt$ represent the Inflation measuring consumer price index in period t; $LFPR_t$ represents the Labour force participation rate in period t, TNR_t denotes total natural resources in period t, while TRD_t represents the trade openness in period t. $\beta_1 - \beta_6$ represents the parameter coefficients of the independent variables. β_0 is the intercept while μt is the stochastic term for those factors not included in the model.

4. Empirical Results

This study uses the ARDL bounds testing approach to examine the long-term link between economic growth indicators. According to Greene (2008), the ARDL model is regarded as a standard least squares regression with lags of the independent and dependent variables as regressors. Despite being used in econometrics for many years, the ARDL model has lately acquired popularity as a way to verify cointegration of economic variables. It was first introduced by Pesaran and Shin (1999) and further expanded upon by Pesaran *et al.* (2000) and Pesaran *et al*. (2001). According to Emeka and Kelvin (2016), the econometric term "cointegration" is used to reflect the existence of a long-run equilibrium among economic variables that converges over time. The ARDL approach is regarded as the most recent of these cointegration techniques used to examine dynamic and equilibrium relationships between dependent variables and independent variables. To investigate if there are long-term equilibrium linkages between economic variables, a number of cointegration techniques have been developed. These include the methods of Saikkonen and Lütkepohl (2000), Johansen (1988), Johansen–Juselius (1990), and Engle–Granger (1987). Before looking for a long-term cointegrating relationship, these traditional cointegration methods usually need the variables determined to be non-stationary and integrated of the same order, usually I (1).

In contrast, the ARDL Bounds -testing approach provides a flexible framework to empirically determine the relationship among the economic variables, regardless of whether the regressors are integrated of order one, stationary at their level, or a combination of both (Pesaran and Shin, 1999; Pesaran *et al*., 2001). Because the ARDL model is built on a single equation framework, which allows it to accept enough lags and guide the data generation process in a general to specialized modelling framework, it is convenient to use (Harvey, 1981). The Wald Test, Long Run OLS estimation test, Error Correction term, and Short Run relation estimation tests are all included in the ARDL cointegration method.

4.1 Descriptive Statistics

One fundamental field of study in statistics is descriptive statistics. It is frequently used to clean up and summarize dispersed data which is essential for doing research and generating inferential statistical comparisons. It also shows the relationship between variables in a given sample. Table 2 represents the descriptive statistics of the data used. The average values of all the variables are provided by the mean. Each variable's significant variation from the sample mean is shown by the standard deviation. The Jarque-Bera test statistic is used to compare the data series' skewness and kurtosis to the normal distribution. The findings demonstrate that the null hypothesis of normalcy cannot be rejected for FDI, GFCF, LFPR, TNR and TRD since their probability values are greater than 0.05. On the other hand, probability values for GDPG and INF are less than 0.05, indicating deviations from normalcy. However, since the order of integration and the lack of I (2) variables are the main factors that determine whether ARDL is appropriate, non-normality in individual variables does not exclude their usage in the ARDL framework.

Table 2: Descriptive Statistics of Variables

Variable	Mean	Std.dev.	Jarque -Bera	Probability
FDI	6.291146	3.9274	2.366539	0.3
GDPG	4.1225	5.4574	9.306576	0.009
GFCF	23.02277	3.705561	0.319171	0.852
LFPR	70.58035	0.740742	0.6552	0.72
TNR	18.93486	8.114787	1.425733	0.49
TRD	75.5958	14.92951	2.254599	0.323
INF	75.634	335.7763	984.906	0.00

Source: Author's computation.
Note: Ho = distribution is normal, which is accepted.

4.2 Unit Root Testing

One of the basic tenets of time series analysis is stationarity, which states that a time series' statistical characteristics—such as its mean, variance, and autocorrelation—remain constant across time. The Unit Root Test assists in identifying if a time series has a unit root or is stationary. Because non-stationary data might result in inaccurate statistical conclusions and predictive models, determining unit roots is essential. To determine the order in which the variables are integrated, unit root tests are employed prior to empirical computations. The premise of ARDL is that no variable is I (2). The distribution of the F-statistic collapses and the test yield useless findings if a series is integrated of order two. The test does not require knowledge of every integration sequence, but it does require confirmation that none of the series are I (2). As a result, reporting unit root test is an essential initial step.

The augmented Dickey-Fuller (ADF) (Dickey and Fuller, 1981) and Phillips and Perron (1988) tests have been used to verify data stationarity at a certain level as well as at the first difference against each variable. The ADF examination is considered excellent due to its widespread use and popularity (Nkoro & Uko, 2016). The null hypothesis of non-stationarity is rejected for variables whose probability value is less than or equal to 0.05. The test results are displayed in

Table 3. The results demonstrated that the variables FDI, GDPG and INF are stationarity at level or in other words, integrated of order zero [I (0)].

On the other hand, because their probability values are less than or equal to 0.05 at their first differences, the majority of variables are stationary at the first difference, or integrated of order one [I (1)]. Apparently, there are no I (2) variables in the current dataset.

Table 3: Unit Root Tests

Variables	Levels		First Difference		Order
	ADF	PP	ADF	PP	
FDI	-2.9549 (0.0510)	-2.961704 (0.0502)			I(0)
GDPG	-3.73284 (0.0096)	-3.769309 (0.0079)			I(0)
GFCF	-1.8492 (0.3506)	-2.217764 (0.2044)	-4.1759 (0.0030)*	-4.1759 (0.0030)*	I(1)
LFPR	-3.064442 (0.0407)	-1.76616 (0.3890)	-3.558704 (0.0133)	-3.558704 (0.0133)	I(1)
TNR	-2.307469 (0.1769)	-2.2177 (0.2069)	-5.36815 (0.0002)*	-5.380806 (0.0002)*	I(1)
TRD	-1.380193 (0.5785)	-1.380193 (0.5785)	-5.802800 (0.0000)*	-5.949088 (0.0000)*	I(1)
INF	-384.25 (0.0001)*	-357.612 (0.0001)*			I(0)

Source: Author's computation.
Note: * shows rejecting Ho at a 1% level of significance. Probability values are shown in parenthesis.

4.3 ARDL MODEL

Taking into account the advantages of the ARDL model, we used it in the empirical research to determine how FDI contributes to Kazakhstan's economic growth. The following is a description of the generalized ARDL (p,q) model:

$$y_t = \alpha_{0i} + \sum_{i=1}^{p} \alpha_i Y_{t-i} + \sum_{(i=0)}^{q} \beta_i X_{t-i} + \varepsilon_t \quad (3)$$

Where "y_t" is the dependent variable, α_{0i} is the intercept in the model, α_i is the coefficient of the dependent variable, β_i is the coefficient of the regressors, where i =1, 2……, k, p and q are the optimal lag orders. ε_t represents the vector of error terms.

4.3.1 The ARDL Model for Long and Short-run Estimation

The ARDL approach is used to test the co- integration. The ARDL model assimilates the short-run dynamics through the error correction model (ECM) without sacrificing the long-run information by adding enough lags to represent the data generation process in general to a particular framework (Laurenseson & Chai, 2003). A straightforward linear translation from

ARDL can easily provide the ECM (Akram & Afzal, 2014). It is the re parameterized ARDL model. The following is the dynamic ARDL model, which is based on Pesaran & Shin (1996):

$$\Delta GDPG_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta GDPG_{t-i} + \sum_{i=0}^{q1} \beta_{2i} \Delta FDI_{t-i} + \sum_{i=0}^{q2} \beta_{3i} \Delta GFCF_{t-i} + \sum_{i=0}^{q3} \beta_{4i} \Delta LFPR_{t-i} + \sum_{i=0}^{q4} \beta_{5i} \Delta TNR_{t-i} + \sum_{i=0}^{q5} \beta_{6i} \Delta TRD_{t-i} + \sum_{i=0}^{q6} \beta_{7i} \Delta INFCP_{t-i} + \lambda_1 GDPGR_{t-1} + \lambda_2 FDI_{t-1} + \lambda_3 GFCF_{t-1} + \lambda_4 LFPR_{t-1} + \lambda_5 TNR_{t-1} + \lambda_6 TRD_{t-1} + \lambda_7 INFCP_{t-1} + \varepsilon_t \quad (4)$$

The first difference operator in equation (4) is represented by the "Δ." In the first portion of the equation, the short-run dynamics are represented by the coefficients "β_{1i} *to* β_{7i}" Additionally, the long-run level relationship between the variables is captured by the lag level terms, denoted by λ_1 to λ_7, which serve as the foundation for the bound's cointegration test.

The constant, or intercept, is denoted by "β_0." The optimal lag length for the dependent variable is denoted by "p." The lag lengths used for exogenous variables are denoted by q1, q2…. q6 respectively, and the error terms are denoted by ε_t

4.3.2 Cointegration test: WALD (F) test

The bound testing method described by Pesaran *et al*. (2001) is used to determine whether the variables of interest (GDP, FDI inflows, GFCF, TNR, TRD and INF) have a long-term connection. The F-test serves as the foundation for the bound testing process. The F-test, which is represented as follows, is essentially a test of the null hypothesis that there is no cointegration among the variables versus the existence or presence of cointegration among the variables:

The null hypothesis Ho: λ1=λ2=λ2=λ4=λ5=λ6=λ7=0 (the variables do not cointegrate). An alternative hypothesis Ha: λ1≠λ2≠λ3≠λ4≠λ5≠λ6≠λ7≠0 (The variables exhibit cointegration).

Table 4: Bounds Cointegration Test Results.

F-statistic	Critical values					
14.83210	1%		5%		10%	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
	2.62	3.77	2.11	3.15	1.85	2.85

Source: author's computation.
Note: H_o: no long-run relationship exists.

The Wald-test (F-statistic) is the foundation of the ARDL bound testing methodology. Pesaran et al. (2001) and Narayan (2005) offer two sets of critical values or asymptotic critical value bounds for different sample sizes under the assumption that the independent variables are I(d) (where $0 \leq d < 1$, that is integrated of order 1 or less). A definitive conclusion can be made if the computed F statistics are outside of the two boundaries. The null hypothesis that there is no cointegration is rejected if the computed value is greater than the upper bound I(1) of the critical values. The null hypothesis that there is no cointegration cannot be rejected if the computed values are less than the lower bound I(0) of the crucial values. However, the test is inconclusive if the computed F falls between the two boundaries, necessitating additional evaluation of the precise sequence of cointegration.

At the 1%, 5%, and 10% significance levels, the calculated F-statistic of 14.83210 is higher than the upper bound critical value (I (1)). As a result, the null hypothesis that there is no cointegration is rejected, indicating that there is a long-term relationship between the variables. Therefore, it is appropriate to estimate the long-run coefficients and the error correction model (ECM).

The best lag lengths in the model are determined using the Akaike information criterion (AIC) and are 2, 0,1,1,0,1 ,0 for the variables GDP _GR, FDI, GFCF, , LFPR, TNR, TRD and INF_CP respectively. In this method, the long-run coefficients are calculated after the variables' cointegration has been established.

4.3.3 Long Run Estimates

The conditional ARDL long-run model is defined as follows once the variables' cointegration is confirmed:

$$GDPG_t = \beta o + \sum \beta_{1i} GDPG_{t-i} + \sum \beta 2i\, FDI_{t-i} + \sum \beta 3i\, GFCF_{t-i} + \sum \beta 4i\, LFPR_{t-i} + \sum \beta 5i\, TNR_{t-i} + \sum \beta 6i TRD_{t-i} + \sum \beta_{7i} INF_{t-i} + \varepsilon_t \quad (5)$$

Equation (5) is estimated using the ARDL (2, 0,1,1,0,1 ,0) specification in accordance with the AIC information criteria. Table 5 presents the findings.

Table 5: Long Run Coefficients

Variable	Coefficient	t-Statistic	Prob.
FDI	0.139561	2.323152	0.0425
GFCF	0.297542	2.406820	0.0369
LFPR	-4.640316	-7.804209	0.0000
TNR	-0.144125	-2.034647	0.0693*
TRD	0.296493	5.078190	0.0005
INF	-0.199290	-4.609564	0.0010
C	329.3835	6.780733	0.0000

Source: Author's computation.
Note: * indicates a 10% level of significance

The estimated long-run coefficients of the ARDL model, which looks at how foreign direct investment and other macroeconomic factors affect Kazakhstan's economic growth, are shown in Table 5. The findings show that economic growth is positively and statistically significantly impacted by FDI (β = 0.1396, p = 0.0425). This suggests that, ceteris paribus, a one-unit increase in FDI boosts GDP growth by roughly 0.14 units over time. Capital accumulation, technology transfer, managerial expertise, innovation, and productivity spillovers are all factors that contribute positively to foreign direct investment. This result is in line with Alfaro et al. (2004), who discovered that FDI fosters long-term growth, and Borensztein, De Gregorio, and Lee (1998), who contended that FDI boosts economic growth through knowledge transfer when backed by favourable domestic circumstances.

Additionally, there is a statistically significant positive relationship between GFCF and economic growth (β = 0.2975, p = 0.0369). This implies that higher fixed asset investments

boost long-term economic performance, strengthen infrastructure, and improve productive capacity. The outcome is consistent with the Solow (1956) growth model, which states that one of the main factors influencing long-term economic growth is capital accumulation.

Trade openness is positively correlated with economic growth, as seen by the positive and highly significant coefficient of TRD ($\beta = 0.2965$, $p = 0.0005$). Improved resource allocation, export competitiveness, technology diffusion, and production efficiency are all facilitated by increased trade openness. This result is in line with the findings of Frankel and Romer (1999), who came to the conclusion that long-term economic growth is significantly aided by international trade.

INF has a negative and statistically significant impact on Kazakhstan's economic growth ($\beta = –0.1993$, $p = 0.0010$). Macroeconomic uncertainty is brought about by persistent inflation, which also deters both international and local investment, lowers purchasing power and degrades overall economic performance. This result is consistent with the findings of Fischer (1993) and Barro (1995), who stated that sustainable economic growth is negatively impacted by macroeconomic instability, especially excessive inflation.

At the 10% level, the TNR coefficient is statistically significant and negative ($\beta = –0.1441$, $p = 0.0693$). The Resource Curse Hypothesis, which contends that an over-reliance on natural resources may obstruct long-term economic progress due to poor institutional development, a lack of economic diversification, and the consequences of Dutch disease, is supported by this research. Sachs and Warner (1995; 2001) came to similar conclusions, showing that economies with rich resources typically grow more slowly over the long term than those with limited resources.

As a stand-in for labour market conditions LFPR has a negative and highly significant long-run coefficient ($\beta = -4.640316$, $p < 0.01$), meaning that a rise in LFPR is linked to a fall in economic growth in Kazakhstan over the study period. This result initially seems to go against traditional growth theory, which typically views labour as a beneficial factor in economic expansion. Nonetheless, the outcome makes sense when considering the structural features of Kazakhstan's labour market. According to Butt et al., Kazakhstan has seen "jobless growth," which is the expansion of economic output without a commensurate rise in productive employment. According to their research, output-employment elasticity has been steadily declining, indicating that productivity gains rather than job creation have been the main driver of recent economic expansion. As a result, greater economic growth has not always correlated with a higher labour force participation rate.

The World Bank's report on Kazakhstan: Reversing Productivity Stagnation (2019, p. 8), claims that despite rising employment rates, declining labour force participation rates led to a reduced labour contribution to economic growth that first waned and eventually turned negative, further supports this interpretation. Likewise, the Republic of Kazakhstan's International Monetary Fund: Kazakhstan's lowering trend growth has been followed by a declining labour contribution and a muted total factor productivity, according to Selected Issues (2022), demonstrating that productivity increases have taken on a more significant role in driving economic growth, with labour becoming a steadily declining source.

The trend of Kazakhstan's labour force participation rate from 1994 to 2024 is shown in Figure 1 in the appendix. The LFPR exhibits a declining trend over the sample period as indicated by the negative slope (−0.0496) of the fitted linear trendline, which is represented by the equation, $\boldsymbol{y = -0.0496x + 71.374,}$ where Y represents the LFPR (%) and X represents time period (year).

Despite brief oscillations in the record, the overall declining trend indicates that labour force participation has steadily declined over time. According to the coefficient of determination (R^2 = 0.3705), the underlying historical trend accounts for about 37.05% of the variation in the labour force participation rate. This downward tendency is in line with the findings of the World Bank (2019) and the IMF (2022), which contend that labour's contribution to Kazakhstan's economic growth has diminished over time.

All of these results point to the need for increases in labour productivity, human capital, employment quality, and the effective use of labour resources in addition to increased labour market participation as a means of promoting sustainable economic growth.

Overall, the long-term ARDL results show that while inflation, natural resource dependence, and labour force participation rate have negative long-term effects, FDI, GFCF, and trade openness support economic growth in Kazakhstan. These results highlight how crucial it is to preserve macroeconomic stability, boost labour productivity, promote profitable investment, and lessen over-reliance on natural resources in order to achieve sustainable economic growth.

4.3.4 Short-term dynamics and the error correction model

We estimate the error correction model in the following stage. The findings of the error correction model show how quickly the model under consideration is adjusted or corrected to return to the long-run equilibrium after a short-run disturbance in order to accurately represent the general data generation process to specific modelling, the accompanying ECM model introduces a sufficient number of lags. Therefore, we estimate an error correction model associated with the long-run estimations in order to obtain the short-run dynamic parameters. This is described as follows:

$$\Delta GDPG_t = \beta_0 + \sum \beta_{1i}\Delta GDPGR_{t-i} + \sum \beta_{2i}\Delta FDI_{t-i} + \sum \beta_{3i} \Delta GFCF_{t-i} + \sum \beta_{4i}\Delta LFPR_{t-i} + \sum \beta_{5i}\Delta TNR_{t-i} + \sum \beta_{6i}\Delta TRD_{t-i} + \sum \beta_{7i}\Delta INFCP_{t-i} + \alpha ECT + \varepsilon_{it} \quad (6)$$

Table 6: Short Run Coefficient Results and ECT

Variable	Coefficient	t-statistic	p-value
D(GDPG)(-1)	0.847401	10.94519	0.0000
D(GFCF)	1.144533	11.40025	0.0000
D(LFPR)	-3.624684	-5.002984	0.0000
D(TRD)	0.316482	12.01738	0.0000
Coint Eq (-1)	-0.7825	-5.0939	0.0000
R^2	0.947373		

Source: Authors Computation.

According to Table 6 short-term results, a number of factors have statistically significant impacts on Kazakhstan's economic growth. The lagged dependent variable, D (GDPG (-1)), exhibits a positive and highly significant coefficient ($\beta = 0.847401$, $p < 0.01$), indicating that economic growth in the past has a positive impact on present economic growth. Additionally (GFCF) shows a positive and statistically significant short-run effect ($\beta = 1.144533$, $p < 0.01$), suggesting that higher investment leads to faster economic growth. Conversely D(LFPR)) exhibits a negative and highly significant coefficient ($\beta = -3.624684$, $p < 0.01$), suggesting that short-term economic growth is negatively correlated with increases in LFPR. D(TRD)) has a positive and statistically significant coefficient, indicating that increased trade openness promotes short-term economic growth.

A stable long-run equilibrium relationship between the variables is confirmed by the Error Correction Term (ECT), which is negative and highly significant ($\beta = -0.7825$, $p < 0.01$). Short-term departures from the long-term equilibrium are gradually remedied, as indicated by the negative sign. Approximately 72.5% of the disequilibrium from the preceding period is corrected within one period, suggesting a relatively rapid adjustment of economic growth towards its long run equilibrium. The research factors in this model control 94.74% of the growth impact; the R-squared value shows that the independent variables have strong explanatory power.

5. Diagnostic Tests

The calculated model is subjected to residual diagnostic tests for heteroskedasticity, serial correlation, and model misspecification. Since the Breusch-Godfrey Serial Correlation LM Test's p-value (0.2104) is higher than 0.05, the null hypothesis that there is no serial correlation is accepted. Another method for figuring out if a series is heteroskedastic is the Breusch-Pagan-Godfrey test. The null hypothesis of no heteroskedasticity, which asserts that the variance of the error term is constant, is supported. The model's well-satedness is assessed using the Ramsey (1969) test. The null denotes that the model has been suitably explained and that the model accepts the null hypothesis.

Table 7: Results of Diagnostic Tests

	Serial Correlation	Heteroskedasticity	Ramsey RESET Test
Test Statistic	1.906258	1.819134	2.531998
Probability	(0.2104)	(0.1709)	(0.1460)

Source: Authors computation.
Note: Values in parenthesis are p-values. Null hypothesis = no serial correlation, no heteroscedasticity, and well specification of the model.

5.1 Stability tests

Figures 2, and 3 in the Appendix-I display the CUSUM and CUSUMSQ graphs for the estimated ARDL models, respectively. Plot analysis reveals that CUSUM and CUSUMSQ statistics fall between the 5% critical boundaries lines, suggesting that the chosen ARDL's short- and long-run coefficients in the specified model are stable. As a result, it can be said that

the regression's coefficients are constant. The study comes to the conclusion that the models mentioned above are ideal (free from issues with serial correlation, heteroscedasticity, or instability) and can be utilized for forecasting and/or more research.

6. Conclusion and policy implications

This study evaluated how FDI affected Kazakhstan's resource-rich economy. GFCF, LFPR, TNR, TRD and INF were all taken into account as control variables. The study uses data from 1994 to 2024 using the ARDL Bounds Co-integration technique. Descriptive statistics and unit root tests were used to analyse the features and stationarity qualities of the data prior to model estimation. The findings supported the application of the ARDL methodology by confirming that the variables were integrated of mixed orders, I (0) and I (1). While the diagnostic and stability tests showed that the estimated model was statistically sound and free from significant econometric issues, the Bounds Test further verified the presence of a stable long-run association among the variables.

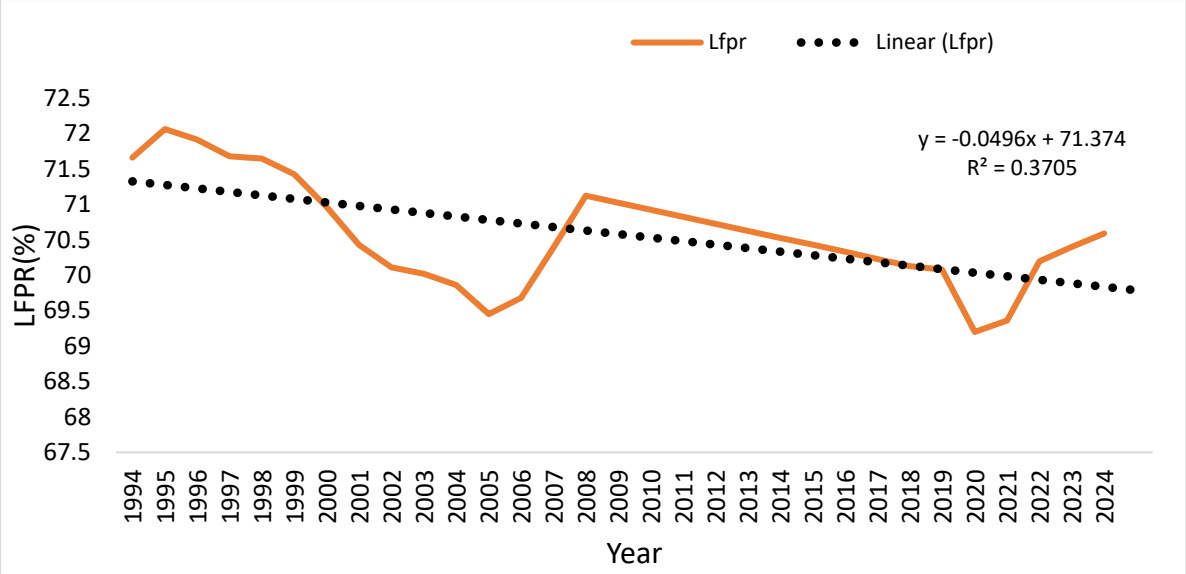
GFCF and TRD were two of the control variables that positively and significantly influenced economic growth, highlighting the significance of both domestic investment and foreign commerce in bolstering Kazakhstan's economic development. On the other hand, both in the short and long terms, LFPR rate showed a strong negative correlation with economic growth. This result is consistent with the structural features of Kazakhstan's labour market, where the main driver o he coefficient for total natural resources was negative but statistically insignificant, indicating that resource richness is not enough to support long-term economic growth. This result is largely in line with the resource curse theory, which contends that, in the absence of robust institutions and efficient governance, an over-reliance on natural resource rents may hinder economic diversification, stifle innovation, and expose the economy to swings in the price of commodities globally. f economic growth has shifted from employment expansion to productivity improvements.

The ARDL model's results show that foreign direct investment continues to be a significant factor in Kazakhstan's long-term economic growth. Foreign investment contributes to economic growth over time through capital accumulation, technological transfer, managerial knowledge, and productivity gains, even though the long-run coefficient of FDI is statistically significant. The lack of a notable short-term impact, however, implies that the developmental advantages of FDI need time to manifest. Thus, the empirical data suggests that while attracting foreign direct investment (FDI) is crucial for maintaining long-term economic growth, the country's institutional framework, investment policies, and capacity to direct FDI into profitable economic sectors all play a major role in how effective FDI is. From the perspective of policy, the results indicate that Kazakhstan should keep upgrading the investment environment while refocusing on luring high-quality, productivity-boosting investment rather than more FDI. With subsequent reforms, such as the Entrepreneurial Code of the Republic of Kazakhstan (2015) and the creation of the Astana International Financial Centre (AIFC), which offers a globally recognized legal and financial framework targeted at boosting investor confidence and facilitating foreign investment, Kazakhstan has steadily strengthened its investment framework since the Law of the Republic of Kazakhstan on Investments (2003)

was adopted. These changes show the government's ongoing dedication to fostering an environment that is conducive to investment.

Instead of continuing to rely too heavily on extractive industries, policymakers should promote foreign investment in technology-intensive manufacturing, renewable energy, logistics, digital industries, and other high value-added sectors, given the positive long-term contribution of FDI found in this study. Overall, Kazakhstan's experience shows that the contribution of investment depends on how well capital, technology, natural resources, and human capabilities are converted into profitable economic activity rather than the presence of investment alone determining the rate or sustainability of economic growth. Therefore, Kazakhstan's task is to use its significant investment potential as a basis for long-term, diverse, and equitable economic growth.

Figure 1: Trend of Labor Force Participation Rate in Kazakhstan (1994-2024)



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Appendix-I

Figure 2: CUSUM stability test

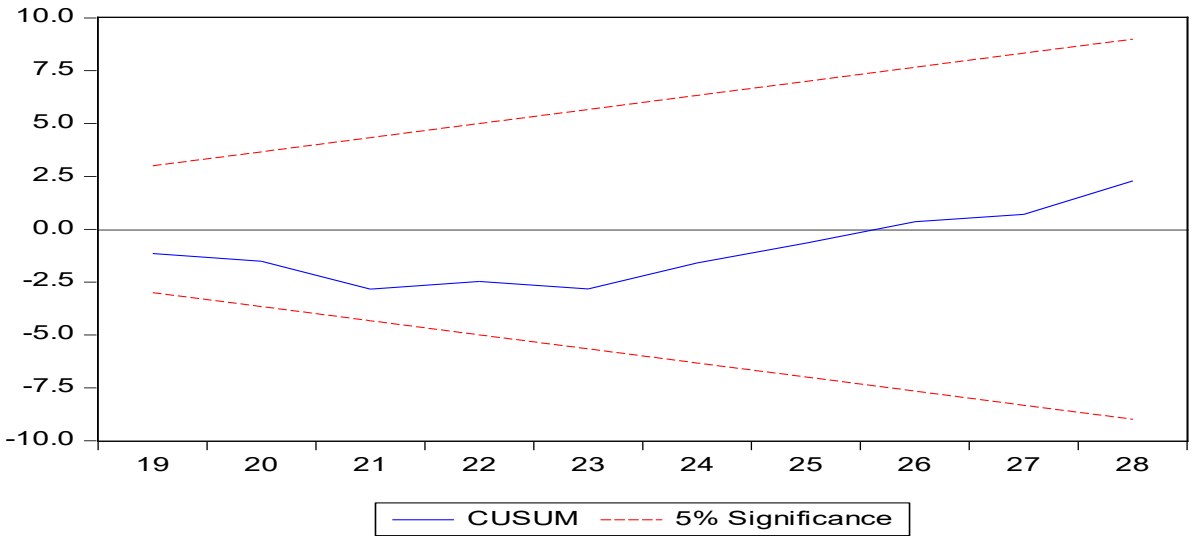


Figure 3: CUSUM of squares stability test

