Kakizhanova, Tolkyn; Askarova, Zhanar; Amirova, Ainur et al.

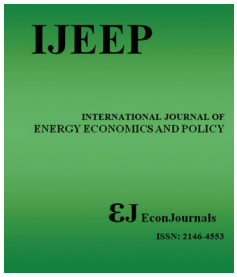
Article

Impact of oil price, CO2 emissons, inflation and economic growth on FDI inflow : case of Kazakhstan

International Journal of Energy Economics and Policy

Provided in Cooperation with:
International Journal of Energy Economics and Policy (IJEEP)

Reference: Kakizhanova, Tolkyn/Askarova, Zhanar et. al. (2024). Impact of oil price, CO2 emissons, inflation and economic growth on FDI inflow : case of Kazakhstan. In: International Journal of Energy Economics and Policy 14 (6), S. 484 - 491. https://www.econjournals.com/index.php/ijeep/article/download/17218/8346/40063. doi:10.32479/ijeep.17218.



International Journal of Energy Economics and Policy

ISSN: 2146-4553

available at http: www.econjournals.com

International Journal of Energy Economics and Policy, 2024, 14(6), 484-491.

Impact of Oil Price, CO_2 Emissons, Inflation and Economic Growth on FDI Inflow: Case of Kazakhstan

Tolkyn Kakizhanova[1], Zhanar Askarova[1], Ainur Amirova[2], Bakhyt Baitanayeva[1], Gulmira Andabayeva[1]*

[1]Al-Farabi Kazakh National University, Almaty, Kazakhstan, [2]Almaty Management University, Almaty, Kazakhstan, *Email: andabayeva.gulmira@kaznu.kz

Received: 20 July 2024 **Accepted:** 10 October 2024 **DOI:** https://doi.org/10.32479/ijeep.17218

ABSTRACT

The aim of this article is to observe impact of mentioned indicators on FDI inflow in Kazakhstan. For this purpose, we used ARDL approach, also conducted testing for the correctness of the chosen method. The results obtained in the model indicate that inflation does not affect the flow of FDI in the short and long term. In addition, CO_2 emissions have positive impacts on FDI both in the short and long term. It is essential to note that extensive research has supported the hypothesis of the benefits of FDI for the environment, since FDI brings not only a flow of money but also knowledge and technology that allow the development of environmentally friendly production. Here, the flow of FDI increases proportionally with increasing CO_2 emissions, so we faced the opposite. As is surprising, the changes in oil price have no effect on FDI inflow in both terms as inflation. And GDP per capita has negative impact on FDI in both short and long runs too. This enables us to assume that the Kazakh economy is not very dependent on FDI and many state programs for the development and growth of the economy can be not particularly associated with FDI.

Keywords: FDI, CO_2 Emissions, Oil Price, Inflation, ARDL, Kazakhstan
JEL Classifications: C33, F1, G2, F3

1. INTRODUCTION

Foreign Direct Investment (FDI) is at the heart of globalisation, and it serves as an impactful provider of the transfer of capital, goods, services, and information across economies (OECD, 2024). Majeed and Ahmad (2008) analyzed the elements of the FDI in 23 developing economies. In addition, FDI's determinants are examined at both micro and macro levels, such as human capital, government spending, military spending, market size and urbanization. FDI inflow is often considered an essential ingredient that carries positive impact on the host economy by bringing technological, knowledge, capital and jobs (Cambazoglu and Karaalp, 2014; Prakash and Assaf, 2001; Rahmonov et al., 2020; Popa, 2022). The likelihood that that the efforts to attract FDI have met with differing success across countries is not hard to guess. Kazakhstan is the leader in attracting FDI in Central Asia. The three countries that brought the most foreign currency to Kazakhstan are: The Netherlands - $3 billion, the USA - $1.9 billion, Switzerland - $1.7 billion (News portal, 2023).

However, the majority of this flow of funds is aimed at grasping mineral resources. Authors aim in the article to assess the impact of FDI on the environment, to determine the dependence of the change in the volume of foreign direct investment on the change in oil prices, to find out how much the economic situation in the country affects the attraction of foreign direct investment. Numerous studies have highlighted the negative impact of FDI flows on the environment. (Choi et al., 2023; Zhang et al., 2023), but there are works that show the opposite (Xiao, 2015; Panayotou, 1997). In general, the politics and legislation in the country play a significant role here, as well as the extent to which these laws are followed. We believe that this will contribute to the correction of

Kazakhstan's open door policy towards FDI in the future. While the volume of FDI can be only attributed to economic growth, it is crucial to determine its contribution to development. In this regard, the authors test 4 hypotheses.

The article's structure as follows: Introduction, Literature review, Methodology, Data and Findings, and Conclusion. To make reading the research paper more convenient and understandable, sections are divided into subsections.

2. LITERATURE REVIEW

2.1. FDI and CO_2 Emissions

Exploring the effect of FDI and economic growth on carbon emissions in Ukraine, Kayani and Sadiq (2022) found positive significant relationship among these indicators. In an attempt to prove that FDI reduces CO26 emissions in China, Zhang and Zhou (2016) find the opposite. Similarly, looking for a relationship between FDI, carbon emissions and economic growth, Omri et al. (2014) conducted a global panel study for 54 countries. According to the results of the study, they found a bidirectional causal relationship between economic growth and FDI inflows for all four panels considered by them. The causal links between FDI and CO_2 emissions are analyzed by Pao and Tsai (2010) in a panel of BRIC countries, and the results of their Granger causality tests indicate the existence of strong bidirectional causality between these variables over the period 1992-2007. Such multi-country studies with same research objects were done by Tsai (1994), Jaunky (2010) and Lee (2013), Wang et al. (2023). Examining potential determinants of carbon emissions, Aller et al. (2021) showed that FDI worsens the environment in low-income countries. There is also an opposite academic point of view: FDI brings capital investment and technology, thus helping to improve the environment. Research works of Eskeland and Harrison (2003), Nguyen et al. (2021) and Xiao (2015) support this hypothesis:

H0: CO_2 emissions have negative impact on FDI inflow.

2.2. FDI and Oil Price

Most of the foreign direct investment in Kazakhstan goes to the western region because it is a source of oil. Tala and Hlongwane (2023) examined effect of oil price changes on FDI inflow in South Africa. Their study showed that in terms of the period under review, exchange rate, inflation rate and oil prices have statistically significant impact on FDI inflows in South Africa. Also, Chiweza and Aye (2018) confirmed significant role of oil price changes on South Africa economy. The NARDL model has been used by Muhammad (2021) to identify the link between oil price and FDI in Nigeria, finding that oil price negatively infuenced FDI in Nigeria in the short-run and long-run. Gupta (2016) analysis for 70 countries on oil price shocks and market uncertainty effect on stock returns showed that macroeconomic stress has negative effect on the firm-level returns. Lagrangean Multiplier (LM) unit root test used by Wong et al. (2015) to investigate the nexus between foreign direct investment, oil prices, and global financial crisis in Singapore, revealed that external shocks of oil price and foreign direct infow were closely related in the short-run. Based on the application of ARDL for the period of 1970-2015 in Saudi Arabia, Mahmood and Alkhateeb (2018) reported that oil price is attractive to foreign investors and positively impact on FDI inflows. Studying the determinants of FDI in oil-dependent economies, Eissa and Elgammal (2020) showed that market growth, trade openness, inflation, infrastructure, oil price and FDI have a positive nexus, but oil reserves have negative impact on FDI. Islam and Beloucif (2024) assessed and classified 112 empirical studies between 2000 and 2018 and found that the size of the host market is the most robust determinant, followed by trade openness, infrastructure quality, labor cost, macroeconomic stability, human capital and the growth prospect of the host country.

H1: Oil price has positive impact on FDI inflow.

2.3. FDI and Inflation

Time series technique of ARDL and NARDL was used by Hossain et al. (2023) to identify significant impact of Bangladesh's FDI inflow on the inflation rate. Studying several countries at once, Boyd et al. (2001), Husnain et al. (2024), Sayek (2009), Xaypanya et al. (2015) found that inflation and FDI have strong relationship on each other. In case of Boyd et al. (2001), panel threshold regression analysis of 97 countries showed that the impact of inflation on economic growth was also influenced by FDI. Using quantitative analysis approach on developing countries Sayek (2009) found that the negative influence of inflation in the economy was found to have been reduced by FDI inflows. Multiple panel regression analysis of ASEAN countries by Xaypanya et al. (2015) resulted that in the ASEAN region, FDI was negatively influenced by inflation. The Bound Test of co-integration was used to determine the relationship between FDI and inflation in Sri Lanka between periods 1978 and 2017 by Mohamed Mustafa (2019). The FDI – Foreign Direct Investment in the framework of a simple regression model affirmed the significant impacts of the FDI – Foreign Direct Investment on the INF – Inflation. In the study of impact of two factors in Nigerian economy, Okafor (2016) found that FDI and inflation have direct relationship, but impact of FDI on investment was insignificant. In identifying the determinants of FDI in India, Patel et al. (2024) observed that the coefficients of domestic investment, infrastructure and Trade Openness were significantly positive influence of inflation was negative.

H2: Inflation has negative impact on FDI inflow.

2.4. FDI and Economic Growth

Working with panel data for developing countries for the 1986-1997 period, Soto (2000) concluded that FDI contributes positively to growth through the accumulation of capital and the transfer of technology. Emeka (2024) observed that FDI positively impacts for Nigerian economy growth by fostering capital formation and technology transfer, however this relationship is influenced by institutional quality and governance effectiveness. By using Granger causality test, Balasuriya (2024) conducted a detailed research on relationship between FDI and economic growth in Sri Lanka and found a bidirectional causality relationship running from FDI to GDP growth and GDP growth to FDI. In line with time samples for period of 1970-1990 for OECD and non-OECD countries, De Mello (1999) estimated the impact of foreign direct investment on capital accumulation, and output and total factor productivity growth in the recipient economy. Results indicated

that the impact of FDI on growth appears to depend inversely on the technological gap between leaders and followers, even though there is evidence that the bulk of FDI occurs across technologically advanced economies. Studying impact of FDI and Labor force on economic growth of SAARC Nation, Shrestha (2024) employed the panel ordinary least square approach and found the evidence of that the presence of foreign direct investment (FDI) into the markets is positive for economic growth, while the presence of FDI into the protected industries is negative. The effects of various exogenous control variables on the quarterly GDP growth in the USA between 1999 and 2022 were examined using a multiple linear regression (MLR) model developed by Matušovičová and Matušovičová (2023). The positive effect of FDI on GDP growth was found at statistical significance of 5% (P = 0.05).
H3: Economic growth has positive impact on FDI inflow.

3. METHODS

Complying with the literature review of the previous section, we study the relationship between FDI and explanatory factors in the Republic of Kazakhstan in the period 1994-2022. In this case, FDI is determined by the following equation:

$$FDI_t = \beta_0 + \beta_1 \cdot CrOil\_pr_t + \beta_2 \cdot CO_{2t} + \beta_3 \cdot Inf_t + \beta_4 \cdot GDP_t + \varepsilon_t, \quad (1)$$

where all of their definitions and measurements are given in the Table 1 above.

In the course of the study, the results of the ADF test show that the studied variables are stationary at the level of I (0) or first differences of I (1) (Table 2). Therefore, ARDL methodology is used, the order of integration of variables is taken into account to determine the suitability of the ARDL model for the study, and a maximum of one lag is selected for the outgoing factor and explanatory variables using a special test.

Based on the Granger causality test using logarithms and the first difference (Table 3), the ARDL linear model was estimated, and a long-term and short-term analysis of the relationship between the variables was carried out. In line with the linear ARDL model, it was confirmed that all independent variables are the cause of changes in the dependent variable. Thus, the ARDL model was created and the results of the boundary test are shown in Table 4.

The first step in the non-linear autoregressive distributed lag model ARDL procedure is the determining the co-integration existence between the sampled variables. The bounds test examines long-run relationships, where the ARDL framework of the model 1 is expressed in Equation 2:

$$\Delta GINI_t = \beta_0 + \beta_1 \cdot \Delta\, GINI_{t-1} + \beta_2 \cdot \Delta FECgrowth_t + \beta_3 \cdot \Delta FECgrowth_{t-1} + \beta_4 \cdot \Delta CDFI_t + \beta_5 \cdot \Delta CDFI_{t-1} + \varepsilon_t, \quad (2)$$

where, operator Δ represents the differencing operation, and Log signifies the natural logarithm of the variables.

4. DATA AND FINDINGS

4.1. Data

This study examines the impact of key economic factors on FDI in the Republic of Kazakhstan. The study uses data for the period from 1994 to 2022, which were obtained from World Data Bank Indicators (WDI), Ourworldindata.org. The explanatory variables identified in this study are CrOil_pr, CO_2, Inf, and GDP.

All of indicators definitions and measurements are given in the Table 1 below.

The dynamic change of all indicators presented in the table in the period 1994-2022 is depicted in the following figure:

From the analysis of the graph presented in Graph 1, it is clear that the variables studied are suitable for analysis. The graph shows obvious, consistent and stable time patterns, which indicates that changes in variables are suitable for further study.

4.2. Empirical Findings

Descriptive statistics. In the study time series variables were used as shown in Table 1. The research applied mean value, median, standard deviation, minimum, maximum, asymmetry and Jarque-Bera statistics for each variable used in our model, and their respective characteristics are described in Table 5 below. Analysis

Table 1: Model variables and sources

Variables	Definitions	Sources
FDI	Foreign direct investment refers to direct investment equity flows in the reporting economy. It is the sum of equity capital, reinvestment of earnings, and other capital. Direct investment is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy. Data are in current U.S. dollars.	WDI
CrOil_pr	West Texas Intermediate (WTI or NYMEX) crude oil prices per barrel	Macrotrends.net
CO_2	Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.	WDI
Inf	Annual percentage change in the cost to the average consumer of acquir-ing a basket of goods and services that may be fixed or changed at speci-fied intervals, such as yearly. The Laspeyres formula is generally used.	WDI
GDP	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used (current US$)	WDI

Source: Compiled by authors

Table 2: ADF unit root tests

Variables	Intercept			Trend and intercept			None		
	Level	First diff.	Order of Integration	Level	First diff.	Order of Integration	Level	First diff.	Order of Integration
FDI	−3.159** (0.034)	−5.519*** (0.000)	I (0)	−3.735** (0.036)	−5.660*** (0.0005)	I (0)	−0.938 (0.302)	−5.630*** (0.000)	I (1)
CrOil_pr	−1.411 (0.563)	−4.492*** (0.0015)	I (1)	−1.975 (0.589)	−4.379** (0.002)	I (1)	0.107 (0.709)	−4.450*** (0.0001)	I (1)
CO_2	−1.418 (0.559)	−4.846*** (0.001)	I (1)	−1.752** (0.700)	−4.739** (0.004)	I (0)	−0.404 (0.529)	−4.947* (0.000)	I (1)
Inf	−378.1*** (0.000)	−5.625*** (0.002)	I (0)	−359.6*** (0.000)	−5.633*** (0.0006)	I (0)	−2.280** (0.024)	−5.854* (0.000)	I (0)
GDP	−0.370 (0.883)	−3.633** (0.012)	I (1)	−2.381 (0.380)	−3.570* (0.052)	I (1)	1.241 (0.941)	−3.326** (0.002)	I (1)

*, **, *** denote statistically significant at the 10%, 5% and 1% levels, respectively P value is inside brackets

Table 3: Noncausality tests in the sense of Granger for the vector autoregressive (1) (1994-2022)

Direction of causality	F-statistic	Prob.
Δ (FDI)		
Δ (CrOil)_pr does not Granger cause Δ (FDI)	0.27988	0.7586
Δ (CO_2) does not Granger cause Δ (FDI)	2.97038	0.0731
Δ (Inf) does not Granger cause Δ (FDI)	0.63186	0.5414
Δ (GDP) does not Granger cause (FDI)	0.11344	0.8933

Table 4: Results of cointegration test

Model	F Statistics	Critical Bounds	Decision
ARDL (1,0,0,0,1)	13.33646	3.01-4.44	Cointegration

Source: Authors Calculation

Table 5: Values of descriptive statistics of the displayed series

Values	FDI	CrOil_pr	CO_2	Inf	GDP
Mean	6.622511	54.04586	11.41168	80.05053	6432.458
Median	5.405185	52.81000	11.32774	7.579999	7165.225
Maximum	13.01286	105.0100	15.34125	1877.372	13890.63
Minimum	0.196995	13.06000	7.904210	5.195684	1130.118
Standard Deviation	3.836899	30.75115	2.129568	347.1100	4381.369
Skewness	0.367948	0.318026	0.165154	5.038374	0.048251
Kurtosis	1.892397	1.811924	2.324625	26.59186	1.487278
Jarque-Bera	2.136729	2.194438	0.682992	795.2244	2.776317
Probability	0.343570	0.333798	0.710706	0.000000	0.249534
Sum	192.0528	1567.330	330.9388	2321.465	186541.3
Sum Sq. Dev.	412.2103	26477.72	126.9817	3373590.	5.37E+08
Observations	29	29	29	29	29

checked variables by mean, median, asymmetry, and minimum and maximum variables.

Based on descriptive statistics, the median of the FDI is 5.405185% and the standard deviation is 3.836899%. The value of the Jarque-Bera statistic is 2.136729, the probability of the link being 0.343570, which is >0.05, so it can be concluded that the series is evenly distributed. The median CrOil_pr 52.8100 and the standard deviation is 30.75115. The Jarque-Bera statistic for Inf alone is 795.2244, according to the probability of a connectedness 0.000, the series is evenly distributed. In Table 5, we can observe that for all indicators, the coefficient of asymmetry of time series is >0, i.e., they have a right asymmetry. Paired correlations of all variables in the series do not exceed 0.9.

4.3. Unit Root Test

Before studying long-term relationships between series, it is important to determine whether they are stationary. There are many unit root tests available to determine if a series is stationary and if there are regression problems. This study used Augmented Dickey-Fuller (ADF) unit root tests to examine levels or differences of variables considered to be stationary. Some variables can be used at level I(0), while other variables are static at first difference I(1). Moreover, further cointegration methods are sensitive to the sample periods. For the purpose of this study, we can compose the ARDL.

Table 2 presents the results of the unit root test of the extended Dickie Fuller (ADF) for the series at level and first difference, as the optimal lag is the first step in the measurement of the ARDL

models. ADF test the non-stationary null hypothesis, which is rejected if ADF is more negative or exceed the absolute critical values of 1%, 5% and 10%. The results show that all variables except Inf are not stationary at the level. However, these variables are stationary in the first difference.

So we should use those variables as the first difference to evaluate the ARDL models. The unit root results are consistent with the underlying assumptions, which require the use of the ARDL model test to confirm the existence of long-term relationships between Kazakhstan's Foreign direct investment, net inflows and the explanatory economic factors proposed in the study.

4.4. Granger Causality Test

To study the causal relationship between the selected variables and the unemployment rate, a Granger test is performed, which tests the null hypothesis that the changes in the dependent variable are not causal (Noncausality). The acceptance criterion is called the P-value. If P<0.05, the null hypothesis is rejected. According to the Table 3, the null hypothesis is not accepted for all variable.

4.5. Co-Integration Test

The ARDL bounds testing procedure is used in this study to examine the long-term relationship between FDI, CrOil, CO_2, Inf, GDP in the Republic of Kazakhstan. To investigate the long-term association of variables with, the ARDL method was chosen using a small sample size. Before a cointegration test can be performed, it is important to define a lag length criterion. The delay length criterion is determined based on LR, FPE, AIC, SC and HQ. Table 6 presents the results of the selected lag. As can be seen from Table 4, the selected lag length is 1 because it has more stars and was used throughout the study.

4.6. Results of Cointegration Test

The results of the cointegration F-test for ARDL (Table 4) show that the obtained F-statistic (13.33646) exceeds the upper bound of 4.44 and is statistically significant at the 10% and 5% significance levels. The results show that the selected variables are cointegrated and in the Kazakhstan case there is a long-run relationship between the variables.

Given that the selected variables are cointegrated over the long term, we can move on to the next stage, which requires the estimation of long-term and short-term coefficients. Given that the ARDL model was evaluated, we can estimate how a change of the explanatory variables affects the dependent variable in both the long and short term.

Graph 1: Evolution of all variables for Kazakhstan (1994-2022)

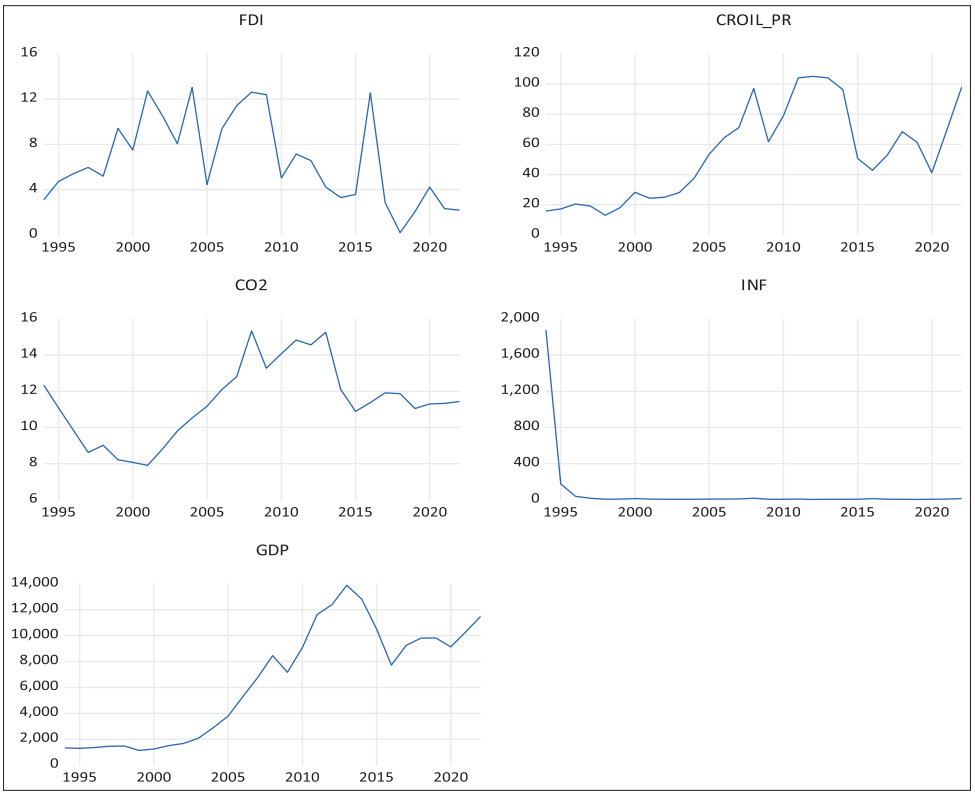


Table 6: Selection order criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	−527.3886	NA	4.20e+11	40.95297	41.19491	41.02264
1	−444.8621	126.9639*	5.25e+09	36.52785	37.97950*	36.94587*
2	−416.4100	32.82933	5.12e+09*	36.26230*	38.92366	37.02868
3	−397.1759	14.79540	1.67e+10	36.70584	40.57691	37.82057

Graph 2: CUSUM and CUSUM squares tests

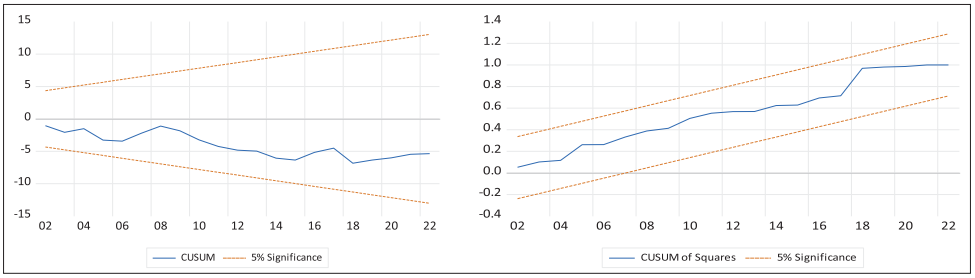


Table 7: ARDL estimation FDI (1994-2022)

Dependent Variable: Δ(FDI)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Short run				
Δ (FDI(-1))*	−1.404623***	0.179211	−7.837818	0.0000
Δ (CROIL_PR)**	0.029478	0.065513	0.449958	0.6574
Δ (CO_2)**	1.483338*	0.841031	1.763714	0.0923
Δ (INF)**	−0.022964	0.026851	−0.855230	0.4021
Δ (GDP1(−1))	−0.001672*	0.000917	−1.824344	0.0824
Δ (GDP)	−0.002528**	0.000993	−2.546940	0.0188
Long run				
Δ (CROIL_PR)	0.020987	0.047072	0.445837	0.6603
Δ (CO_2)	1.056040*	0.603578	1.749633	0.0948
Δ (INF)	−0.016349	0.018977	−0.861533	0.3987
Δ (GDP)	−0.001191*	0.000651	−1.829430	0.0816

1) coefficients are statistically significant at ***1%, **5%, *10% level of significance.
2) compiled by the authors

Table 8: Short-run diagnostics

Test	F-statistics	P-value
Serial correlation	2.453293	0.1128
Heteroskedasticity	0.531683	0.7778
Jarque-Bera	1.141670	0.5651

4.7. Results of Long-- and Short- Run Relationship

In the course of the study, the nonlinear ARDL (Equation 2) model was estimated using the first difference according to the results of the ADF test, and in order to conduct a long-term and short-term analysis of the relationship between variables, the obtained results are presented in the following table.

In Table 7, the data show that an increase in CO_2 emissions (metric tons per capita) in the current year Δ (CO_2) has a positive effect on Foreign direct investment, net inflows (% of GDP), while an increase (also an increase) in GDP per capita (current US$) has a negative effect on FDI in Kazakhstan. Short term, increases in GDP (GDP(−1)) have a negative impact.

Table 7 (the actual growth rate in Kazakhstan's GDP per capita is shown to be decreasing), as in the long term, an increase in GDP per capita is correlated with an increase in FDI and thus, Kazakhstan could effectively decouple economic growth from FDI. This means that the country can achieve economic growth while simultaneously reducing foreign investment. Increasing CO_2 emissions Δ(CO_2) effect positively. Furthermore, the dependence of FDI in period t on the value in period t−1 was confirmed. The constructed model proved the negative influence of the lagged variable FDI(1). And the impact of inflation in the short term and long term was not confirmed.

4.8. Diagnostic Tests

It is extremely important to conduct a series of tests to ensure the stability of the linear ARDL model. Among them are serial correlation, tests for normality and heteroscedasticity. For this model, the null hypothesis of the absence of serial correlation, homoscedasticity, or normality cannot be rejected. This suggests that the model is free from serial correlation and heteroscedasticity.

Table 8 shows the results of diagnostic studies. The LM statistic is 2.453293, has a probability value of 0.1128. As a result, we accept the null hypothesis in this analysis and conclude that there is no serial correlation in the model. Heteroscedasticity tests revealed an F-statistic of 0.531683and a probability of 0.7778, both of which exceed a significance level of 0.05%, showing that the model is homoscedastic.

The model accepts the null hypothesis of the normality test and concludes that the residuals are distributed normally, as evidenced by the F-statistic of 1.141670 and the probability value of 0.5651, both of which have a significance level >5%. Finally, all diagnostic tests for the serial correlation test of the Langrage multiplier, the Jarque-Bera normality test and the heteroscedasticity test were successful, which indicates the stability of the model.

4.9. Stability Tests

The CUSUM and CUSUM squares tests are used to see if the coefficients of the estimated models remain constant over time, which is an indicator of the stability of the model.

The results of the CUSUM and CUSUM stability tests are shown in Graph 2. At 5%, the importance of the blue line not crossing the red lines indicates that the model is stable. This test is also used to study the long-term dynamics of regression.

5. CONCLUSION

In this article we study impact of CO_2 emissions, Inflation, GDP per capita and Oil price on FDI inflow. The data range is 1994-2022 and was obtained from the World Data Bank Indicators (WDI), Ourworldindata.org. websites. The study results revealed that inflation and oil prices did not impact FDI in the short and long term. Thus, H2 which states that Inflation has negative impact on FDI in both terms and H1 which states Oil price changes have positive impact on FDI in both terms are not proven. The model

showed that CO_2 emissions have a positive effect on FDI in both the short and long term. That is, HO which states CO_2 emissions have negative impact on FDI is not proven. The model showed that GDP per capita has a negative impact on FDI in both the short term and the long term. Consequently, H3 which states economic growth has positive impact on FDI is not proven.

As an active recipient of foreign direct investment, Kazakhstan must ensure proper review of environmental issues and place greater emphasis on developing environmental protection. The implementation of rules and laws by foreign companies in the field of environmental safety by the government is very important, not only to monitor with extreme care, but also to tighten them if necessary. We can conclude that the FDI dependence of Kazakhstan's economic growth can be clearly seen in the results of the model. We suggest that the government should not focus so much on the attracting of investment, but develop its own clusters and domestic production.

REFERENCES

Aller, C., Ductor, L., Grechyna, D. (2021), Robust determinants of CO_2 emissions. Energy Economics, 96, 105154.

Balasuriya, K. (2024), FDI and Economic Growth in Sri Lanka: A Granger Causality Testing. In: Conference: South Asian Economics Students Meet-2011 At: Ramjas College University of New Delhi.

Boyd, J.H., Levine, R., Smith, B.D. (2001), The impact of inflation on financial sector performance. Journal of Monetary Economics, 47(2), 221-248.

Cambazoglu, B., Simay Karaalp, H. (2014), Does foreign direct investment affect economic growth? The case of Turkey. International Journal of Social Economics, 41(6), 434-449.

Chiweza, J.T., Aye, G.C. (2018), The effects of oil price uncertainty on economic activities in South Africa. Cogent Economics and Finance, 6(1), 1-17.

Choi, Y., Ma, Y., Zhao, Y., Lee, H. (2023), Inequality in fossil fuel power plants in China: A perspective of efficiency and abatement cost. Sustainability, 15(5), 4365.

De Mello, L. (1999), Foreign direct investment-led growth: Evidence from time series and panel data. Oxford Economic Papers, 51, 133-51.

Eissa, M.A., Elgammal, M.M. (2020), Foreign direct investment determinants in oil exporting countries: Revisiting the role of natural resources. Journal of Emerging Market Finance, 19(1), 33-65.

Emeka, I. (2024), Foreign direct investment (FDI) and economic growth in Nigeria. Journal of Poverty, Investment and Development, 9(1), 13-25.

Eskeland, G.S., Harrison, A.E. (2003), Moving to greener pastures? Multinationals and the pollution haven hypothesis. Journal of Development Economics, 70(1), 1-23.

Gupta, K. (2016), Oil price shocks, competition, and oil & gas stock returns- global evidence. Energy Economics, 57, 140-153.

Hossain, S., Hosen, M., Thaker, H., Sharma, G., Masih, M., Pek, C.K. (2023), Is the association between FDI and Inflation symmetric or asymmetric? Evidence from ARDL and NARDL techniques. The Singapore Economic Review. Available at: https://doi.org/10.1142/S0217590823500455

Husnain, M.A., Guo, P., Pan, G., Manjang, M. (2024), Unveiling the interplay of institutional quality, foreign direct investment, inflation and domestic investment on economic growth: Empirical evidence for Latin America. International Journal of Economics and Financial Issues, 14(1), 85-94.

Islam, M.S., Beloucif, A. (2024), Determinants of foreign direct investment: A systematic review of the empirical studies. Foreign Trade Review, 59(2), 309-337.

Jaunky, V.C. (2010), The CO_2 emissions-income nexus: Evidence from rich countries. Energy Policy, 39, 1228-1240.

Kayani, F.N., Sadiq, M. (2022), Analyzing the impact of inward FDI and economic growth on CO_2 emissions of Ukraine. International Journal of Energy Economics and Policy, 12(5), 202-208.

Lee, W.J. (2013), The contribution of foreign direct investment to clean energy use, carbon emissions and economic growth. Energy Policy 55, 483-489.

Mahmood, H., Alkhateeb, T. (2018), Foreign direct investment, domestic investment and oil price nexus in Saudi Arabia. International Journal of Energy Economics and Policy, 8, 147-151.

Majeed, M.T., Ahmad, E. (2008), Human capital development and FDI in developing countries. Journal of Economic Cooperation, 29(3), 79-104.

Matušovičová, M., Matušovičová, S. (2023), The impact of foreign direct investment management on economic growth using multiple linear regression (MLR). TEM Journal, 2023, 2326-2332.

Mohamed Mustafa, A. (2019), The relationship between foreign direct investment and inflation: Econometric analysis and forecasts in the case of Sri Lanka. Journal of Politics and Law, 12, 44.

Muhammad, S. (2021), Oil price and foreign direct investment in Nigeria: New evidence from structural breaks and a nonlinear analysis. CBN Bullion, 45(4), 58-66.

News Portal. Available from: https://www.nur.kz/politics/universe/2052615-pritok-pryamyh-inostrannyh-investitsiy-v-kazahstan-v-i-polugodii-sostavil-133-mlrd-dollarov

Nguyen, D.K., Huynh, T.L.D., Nasir, M.A. (2021), Carbon emissions determinants and forecasting: Evidence from G6 countries. Journal of Environmental Management, 285, 111988.

OECD (2024), OECD Economic Outlook, Volume 2024 Issue 1: An unfolding recovery, OECD Publishing, Paris, https://doi.org/10.1787/69a0c310-en.

Okafor, I.E. (2016), The impact of foreign investments on domestic inflation in Nigeria: A disaggregated analysis. IOSR Journal of Economics and Finance, 7(2), 25-32.

Omri, A., Nguyen, K., Rault, C. (2014), Causal interactions between CO_2 emissions, FDI, and economic growth: Evidence from dynamic simultaneous-equation models. Economic Modelling, 42, 382-389.

Panayotou, T. (1997), Demystifying the environmental Kuznets curve: Turning a black box into a policy tool. Environment and Development Economics, 2(4), 465-484.

Pao, H.T, Tsai, C.M. (2010), CO_2 emissions, energy consumption and economic growth in BRIC countries. Energy Policy, 38, 7850-7860.

Patel, R., Mohapatra, D., Yadav, S. (2024), Analysis of FDI determinants using autoregressive distributive lag model: Evidence from India. Finance: Theory and Practice, 28, 144-156.

Popa, C. (2022), The importance and evolution of FDI inflows in CHINA. REVISTA Economica, 74, 30-39.

Prakash, L., Assaf, R. (2001), How beneficial is foreign direct investment for developing countries? Finance and Development: A Quarterly Magazine of the IMF, 38(2), 6-9.

Rahmonov, T., Baymuratova, Z., Kalimbetov, K., Bakhitjan, S. (2020), Foreign direct investment: Importance for the development of the country's economy. 63. 9804-9812.

Sayek, S. (2009). Foreign direct investment and inflation. Southern Economic Journal, Vol. 76, No. 2, pp. 419-443.

Shrestha, A. (2024), Impact of FDI on economic growth of SAARC Nation. Journal of Production, Operations management and economics. Solid State Technology, 4, 28-38.

Soto, M. (2000), Capital Flows and Growth in Developing Countries:

Recent Empirical Evidence. OECD Development Centre Technical Paper, Paris.

Tala, L., Hlongwane, T.M. (2023), How oil price changes affect foreign direct investment inflows in South Africa? An ARDL approach. International Journal of Economics and Financial Issues, 13(2), 115-123.

Tsai, P.L. (1994), Determinants of foreign direct investment and its impact on economic growth. Journal of Economic Development, 19, 137-163.

Wang, Q., Yang, T., Li, R., Wang, X. (2023), Reexamining the impact of foreign direct investment on carbon emissions: Does per capita GDP matter? Humanities and Social Sciences Communications, 10, 406.

Wong, K.N., Goh, S.K., Lean, H.H. (2015), Foreign direct investment, oil prices and global financial crisis: Evidence from Singapore. Journal of Applied Economic Sciences, 4, 494-504.

Xaypanya, P., Rangkakulnuwat, P., Paweenawat, S.W. (2015), The determinants of foreign direct investment in ASEAN. The first differencing panel data analysis. International Journal of Social Economics, 42(3), 239-250.

Xiao, Z. (2015), An empirical test of the pollution haven hypothesis for China: intra-host country analysis. Nankai Business Review International, 62, 177-198.

Zhang, C., Zhou, X. (2016), Does foreign direct investment lead to lower CO_2 emissions? Evidence from a regional analysis in China. Renewable and Sustainable Energy Reviews, 58, 943-951.

Zhang, Z., Nuță, F.M., Dimen, L., Ullah, I., Xuanye, S., Junchen, Y., Yihan, Z., Yi, C. (2023), Relationship between FDI inflow, CO_2 emissions, renewable energy consumption, and population health quality in China. Frontiers in Environmental Science, 11, 1120970.