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Reflections of Geopolitical Risk on Foreign Direct Investments: The Case of Türkiye

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Abstract

A way to achieve sustainable economic growth in developing countries is to increase investments with domestic savings. However, not every country has an equal opportunity in terms of domestic savings. The desired level of investment expenditures cannot be reached in countries with a savings gap. In this case, foreign direct investment (FDI) becomes more valuable in meeting countries' investment needs. Nevertheless, companies may not behave very bravely in their investment actions in other countries. There is a considerable risk and uncertainty avoidance in the nature of investment because uncertainty and risk are accepted as harbingers of instability for a country. Since the main goal of companies is to make a profit, they may start thinking that they will not have the opportunity to make a profit in an unstable economy. Hence, the risk perception in the investment environment must be low for developing countries to become attractive for FDI inflows. Geopolitical risks, as well as economic, political, and strategic risks that countries will be exposed to, are important indicators considered in FDI inflows. Literature research shows that investors are aggressive in investing with a profit appetite and, with exceptions, are sensitive to geopolitical risks. In other words, FDI decreases in countries where geopolitical risks tend to increase. The present study tested the validity of this assumption in the literature for Türkiye. The impact of geopolitical risks on FDI was analyzed with the ARDL Boundary Test Approach for the period 1985-2020. FDI inflows were used as the dependent variable, and the Geopolitical Risk (GPR) Index, a measure of geopolitical risk, was used as the independent variable. Moreover, growth, globalization, and inflation are the other independent variables analyzed. The test results demonstrated the negative effect of the increase in the GPR index on FDI inflows. In terms of the results obtained, the study provides an important perspective on the prioritization of the geopolitical risk factor in the evaluation of foreign investment performance.

Keywords: ARDL Boundary Test, Foreign Direct Investment, Economic Growth, Geopolitical Risk, Turkish Economy.

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Jeopolitik Riskin Doğrudan Yabancı Sermaye Yatırımları Üzerine Yansımaları: Türkiye Örneği

Ali ALTINER ¹

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Öz

Gelişmekte olan ülkelerde sürdürülebilir iktisadi büyümeyi sağlamanın bir yolu yurtiçi tasarruflarla yatırımları artırmaktır. Fakat her ülke yurtiçi tasarruflar açısından eşit şansa sahip değildir. Tasarruf açığı olan ülkelerde özel yatırım harcamaları istenilen düzeye ulaşamamaktadır. Bu durumda ülkelerin yatırım ihtiyacını karşılamada doğrudan yabancı sermaye yatırımları (FDI) daha kıymetli hale gelmektedir. Fakat firmalar başka ülkelere yatırım aksiyonlarında çok cesur davranamayabilirler. Yatırımın doğasında önemli ölçüde risk ve belirsizlikten kaçınma bulunmaktadır. Çünkü belirsizlik ve risk bir ülke için istikrarsızlığın habercisi olarak kabul edilmektedir. Firmaların ana amacı kar elde etmek olduğundan, istikrarsız bir ekonomide kar elde etme olanaklarının olmayacağı fikrine kapılabilirler. Bu sebeple gelişmekte olan ülkelerin, FDI girişleri için çekici hale gelmelerinde yatırım ortamında risk algısının düşük olması gerekmektedir. Ülkelerin maruz kalacağı ekonomik, politik ve stratejik riskler kadar jeopolitik riskler de FDI girişlerinde dikkate alınan önemli bir göstergedir. Literatür araştırmaları kar iştahıyla yatırım yapma konusunda agresif ve istisna olanlar dışında yatırımcıların jeopolitik risklere duyarlı olduğunu göstermektedir. Yani jeopolitik risklerin artış eğilimi gösterdiği ülkelerde FDI azalmaktadır. Bu çalışmada literatürdeki bu varsayımın Türkiye açısından geçerliliği test edilmiştir. Jeopolitik risklerin FDI üzerindeki etkisi 1985-2020 dönemi için ARDL Sınır Testi Yaklaşımı ile analiz edilmiştir. Bağımlı değişken olarak FDI girişleri, bağımsız değişken olarak jeopolitik riskin bir ölçüsü olan Jeopolitik Risk (GPR) endeksi kullanılmıştır. Ayrıca büyüme, küreselleşme ve enflasyon analiz edilen diğer bağımsız değişkenlerdir. Test sonuçları, GPR endeksindeki yükselişin FDI girişleri üzerinde negatif etkili olduğunu göstermiştir. Çalışma elde edilen sonuçlar itibarıyla, yabancı yatırım performansının değerlendirilmesinde jeopolitik risk faktörünün önceliklendirilmesi hususunda önemli bir bakış açısı sunmaktadır.

Anahtar Kelimeler: ARDL Sınır Testi, Doğrudan Yabancı Sermaye Yatırımları, Ekonomik Büyüme, Jeopolitik Risk, Türkiye Ekonomisi.

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Introduction

Recently, there has been a significant increase in the analysis of the situation and developments in the world in terms of political, economic and social aspects. Analyses are considered valuable tools, especially in societies that are heavily exposed to the effects of globalization and have difficulty maintaining control in their own fields in the face of crises. In these analyses, it is becoming increasingly common to identify, list, and examine the impacts of geopolitical risks (Suárez-de Vivero and Mateos, 2017, p.19). Thus, many researchers associate the term economics with geopolitics because they think that economics is often the key to understanding many geopolitical situations. For example, it is known that the desire to take control of oil resources and fertile lands affected the American interventions in the Gulf in 1992 and Iraq in 2003 (Giblin, 2013, p.1).

“Geo” is related to land in a broad sense, and nowadays, it brings to mind land, sea, air, and space. In a narrower sense, it includes regulating raw materials to transform terrestrial areas into a politically controlled territory. On the other hand, it encompasses broader socio-spatial connotations since the world has become more integrated. Here, “politics” is used to describe actions based on the regionalization of political power. Geopolitics describes an objective reality, first; a series of political imaginations, second; a discipline examining this objective reality and political imaginations, third; and a concept including real-world applications, fourth. Geopolitics researches the political aspects of land ownership and management (Jessop and Sum, 2018, p. 474-475). While the term geopolitics is developing in the literature, it is very challenging to mention a generally agreed definition. As stated earlier, although geopolitics was associated with land and sea in early studies, it is regarded as a broader phenomenon nowadays. While Dalby (2013) and Overland (2015) indicated the need for climate change in their studies on geopolitics, Caldara and Iacoviello (2022) argued that geopolitics encompassed a wide variety of geo-events, such as financial crises and even Brexit. Many notable overt or more implicit geopolitical events have occurred, such as the South China Sea conflict, Brexit, the China-US trade war, and the Russia-Ukraine crisis, over the past decade. Geopolitical issues bring about risks for many economic actors in the global market (Lu and Liu, 2022, p.1-3). In addition to these examples of geopolitical risks in the world, it is also known that Turkey carries some unique geopolitical risks. Turkey is located in one of the most risky geographical locations in the world. The Middle East is an important geopolitical risk region due to its rich oil resources. In this region, the risk of conflict at the international level, the collapse of national governments, crises, terrorist attacks and even the presence of weapons of mass destruction pose a significant threat. Turkey's proximity to such a turbulent land imposes a significant cost on the country's economy, especially due to the transfer of immigrants. On the other hand, Türkiye is a peninsula located at the intersection of three continents. It has highly mobile straits and waterways. In addition, being on the Silk Road route in trade and transportation is seen as another geopolitical risk. The increased risk perception reduces investment appetite by creating a disadvantage for large projects from the stock market to international companies and even banks. Here, understanding and ranking geopolitical risks is very important for repositioning in the changing global market environment.

Geopolitical risk is associated with wars and military conflicts. Apart from this traditional approach, although the periods and types of geopolitical risk are very

diverse, it refers to instability and uncertainties associated with a region, even specific to it. In other words, it includes vulnerability and exposure to different types of risks (Suárez-de Vivero and Mateos, 2017, p.19). In general, geopolitical risk covers actions in three dimensions: political (social unrest, war, religious conflicts, etc.), economic (trade frictions, protectionism, anti-globalization, etc.), and natural events (drought, earthquake, tsunami, etc.) (Yu and Wang, 2023, p.14). Different institutions develop various measurement methods regarding geopolitical risks and how they can be expressed. Suárez-de Vivero and Mateos (2017) presented a comparative analysis of reports and studies addressing geopolitical risks and trends. Despite numerous measurement methods, GPR is one of the most remarkable researches measuring geopolitical risks. The index, developed by Dario Caldara and Matteo Iacoviello, includes eight categories. These categories are as follows: Category 1 - War Threats, Category 2 - Peace Threats, Category 3 - Military Buildups, Category 4 - Nuclear Threats, Category 5 - Terror Threats, Category 6 - Beginning of War, Category 7 - Escalation of War, Category 8 - Terror Acts. Furthermore, the Geopolitical Threats (GPRT) index and the Geopolitical Actions (GPRA) index are two sub-indices including categories 1 to 5 and categories 6 to 8, respectively (Economic Policy Uncertainty, 2023; Caldara and Iacoviello, 2022, p.1199). Caldara and Iacoviello (2022) created the GPR index based on newspaper reports. They addressed the events suitable for the definition of global and country-specific geopolitical risk in 11 major newspapers on a daily and monthly basis. The index, which addresses the events in 25 million newspaper news from 1900 to the present, provides data since 1985. In the study, a new index was created by defining geopolitical risk as the threat, realization, and escalation of adverse events related to wars, terrorism, and all kinds of tensions between states and political actors that impact the peaceful course of international relations. Moreover, the researchers examined the effects of a shock concerning geopolitical risk on investment, employment, and stock prices using econometric methods in a country-specific manner. They found that higher GPR values indicated a higher probability of economic disaster and lower expected GDP growth. Additionally, the study showed that firms in sectors exposed to high geopolitical risk exhibited low investment using firm-level data (Caldara and Iacoviello, 2022, p.1195-1196). The fact that high geopolitical risk means low investment capability for domestic firms has a similar effect for foreign direct investments. According to UNCTAD (2021), the World Investment Report, international direct investment flows in 2020 decreased from 1.5 trillion dollars to 1 trillion dollars compared to 2019, in other words, there was a decrease of about 35%. This decrease is almost 20% more than the financial crisis in 2009. Upon analyzing these years, many geopolitical events have occurred in the world. These shocks have created uncertainty in the global political economy and caused fragility in international relations with new geopolitical tensions and, thus, led to the emergence of global economic recession concerns. Uncertainty in the economic environment of a country in which investments are traditionally made constitutes a potential source of economic costs. When multinational companies face such risks, they either postpone their investments or redistribute their investments to places they regard to have lower risks. Hence, higher political and economic risks may prevent FDI inflows. The limited political and economic knowledge of foreign investors about the country in which they will invest causes them to be more sensitive to geopolitical risks in comparison with domestic investors. Since investors act with the risk aversion behavior, international investments

shift from places with high geopolitical risk to places with low risk (Yu and Wang, 2023, p.1-3; Lu and Liu, 2022, p.6-7).

Investigating whether geopolitical risks have a deterrent effect on FDI and, if so, the magnitude of this effect provides important information about countries' investment environments. Therefore, the study addressed how much geopolitical changes in Turkey impacted FDI performance. There were two important motives to conduct the study. First, Turkey is one of the countries most affected by the events occurring due to geopolitical risks because of its geographical location. The ongoing uncertainties on Turkey's southern borders, particularly in Syria, the tensions in the Middle East, the Russia-Ukraine war lasting more than a year, and finally, two major earthquakes in Kahramanmaraş increase geopolitical tensions. For Turkey to transform its current position into an opportunity and become a regional power, it should establish the correct link between geopolitical risk and political economy. Therefore, it is important to determine the impact of geopolitics in Turkey in terms of FDI. Second, as stated in the literature section, there are relatively few studies investigating the relationship between geopolitical risk and FDI. Hence, it is thought that a new study will contribute to providing an idea to researchers who are curious about geopolitical risk and FDI.

In the study examining Turkey's 1985-2020 period, the analysis was conducted based on the ARDL Boundary Test Approach. Within this framework, the study plan was created as a summary of the literature, the introduction of the analysis method, the presentation of the findings, and listing the policy recommendations after the introduction section.

Literature Review

The impact of the risk factor on FDI movements has been the focus of various studies in the fields of international economy, finance, and politics. There are also studies considering geopolitical risk as a type of risk. However, in general, the link between FDI and geopolitical risk has been overshadowed by the search for FDI determinants in the literature. In other words, whereas researchers were attempting to reveal the variables, the determinants of FDI, they added the geopolitical risk variable to their studies. Therefore, as seen in the studies listed below, there are fewer studies specifically addressing the FDI-geopolitical risk link, which reveals the gap in the relevant field in the literature. Another issue related to the literature is that geopolitical risks are accepted as a parameter that causes negative results for FDI. In terms of the results of the studies, there was a negative correlation between FDI and geopolitical risk in general, while De Angelo et al. (2010), Rauf et al. (2016), Zeng and Li (2019), Asaad et al. (2020), Afşar et al. (2021), Ayten (2021), Caldara and Iacoviello (2022), Carpenter (2022), Özşahin et al. (2022) are studies conducted on a single country. Articles with a large number of cross-section units, such as many countries or companies, are reported by Chanegriha et al. (2017), Dissanayakea et al. (2018), Arslan (2019), Dedeoğlu et al. (2019), Kim et al. (2019), Wang et al. (2019), Fania et al. (2020), Le and Tran (2021), Luo (2021), Ceyhan and Gulcan (2022), Dastan et al. (2022), Li et al. (2022), Lu and Liu (2022), Nhuyen et al. (2022), Thakkar and Ayub (2022), Busy and Zheng (2023), Feng et al. (2023), Yu and Wang (2023). The selected literature summary from these studies is given below:

De Angelo et al. (2010) performed an analysis on the determinants of FDI in Brazil. In the research conducted by creating 3 different models, foreign exchange rate variables

were used as an indicator of international sales and country risk. In the study, in which two-stage least squares regression analysis was used, it was concluded that the increase in country risk had negative effects on FDI.

Rauf et al. (2016) examined the effects of terrorism and political stability variables, which they used as indicators of country risk in Pakistan, on FDI inflow. In addition, the OLS method was used in the study, which covers the period 1970-2013, including GDP and trade openness variables. The results showed that the increase in terrorism has a negative effect on FDI.

Chanegriha et al. (2017) investigated the interaction between FDI and geographic, economic, and political phenomena through the extreme Bounds Analysis in 168 countries between 1970 and 2006. The results showed that the variables posing geopolitical risk were adversely correlated with FDI inflows.

Dissanayakea et al. (2018) conducted an Industry Analysis for 500,219 companies with quarterly data for the period January 1985-December 2019. The results of the analysis are that firms with higher cash holdings drastically reduce investments during periods of high uncertainty.

Arslan (2019) studied the relationship between FDI and geopolitical risk based on static panel data analysis in 18 developing countries using the data covering the period 1985-2017. The findings demonstrated that geopolitical risk had a negative and significant effect on FDI.

Dedeoğlu et al. (2019) analyzed the impact of geopolitical risk and management quality on FDI in 18 developing countries between 1996 and 2016 with GMM-based estimates, considering some other control variables. According to the study, good governance has a positive effect on FDI, while geopolitical risk has a negative effect on FDI.

Kim et al. (2019) examined the impact of geopolitical risk for different investors in North Korea. The sampling period was January 1, 2015 - December 31, 2017, and 505 companies were considered. Baseline Regression Model results showed that foreign investments decreased and domestic investments increased as geopolitical risk increased in North Korea due to increasing information asymmetry.

Wang et al. (2019) researched the relationship between investments and GPR in 9088 companies with baseline regression analysis using the TCRSP/Compustat Merged Database data for the period 1987Q1-2016Q4. The researchers found that when the GPR index doubled, the next-quarter investment decreased by 14% of the sample average.

Zeng and Li (2019) discussed whether FDI preferences and US threat perception were related using the survey method in China. The results indicated that the perception of geopolitical risk adversely affected FDI inflows by disrupting bilateral relations.

Asaad et al. (2020) investigated the effects of geopolitical risk and human capital on FDI in Iraq. In their study on the period 2004-2018, they emphasized the importance of improving stability and security conditions in the country, as risk factors have negative effects on FDI.

Fania et al. (2020) determined the impacts of geopolitical risk, political risk, macroeconomic risk, and its components on FDI in 16 countries in Africa during the

period 2011-2017 with GLS. The results showed that despite the effect of geopolitical risk on FDI, it affected the components at a different level.

Afşar et al. (2021) tested whether geopolitical risk affected FDI using some other variables with the ARDL Boundary Test and Granger-Causality analysis in Turkey between 1994 and 2018. The analysis results revealed that geopolitical risk had a negative effect on FDI in Turkey and there was a unidirectional causality from geopolitical risk to FDI.

Ayten (2021) investigated the effect of geopolitical risk in his study on the determinants of foreign direct investments in Turkey. In this context, as a result of the ARDL analysis applied for the period of 2006-2020, it was found that the geopolitical risk factor had a negative effect on FDI in the long run.

Le and Tran (2021) identified the effect of geopolitical risk on institutional investments in developing Asian countries during the period 1995-2018 with the GMM analysis. The effect of geopolitical risk on firm investments is negative, and the negative effect is less for firms with more cash.

Luo (2021) aimed to find the effects of geopolitical risk on FDI in various regional economies such as Europe, South Asia and Latin America during the period 2010-2019. In the study, which used economic growth and 12 political risk variables, it was determined that there was no negative relationship between geopolitical risk and FDI in all countries.

Caldara and Iacoviello (2022) investigated the impact of a geopolitical risk shock on employment, investment, and stock markets with the VAR model between 1985 and 2019. Furthermore, they provided information about the investment effects of geopolitical risk with industry and company data. The researchers revealed that high geopolitical risk was a harbinger of low investments.

Ceyhan and Gulcan (2022) researched the effect of geopolitical risk on financial development and FDI in the G8 countries between 1985 and 2020. The Kónya causality test results showed that there was a causality from geopolitical risk to FDI and financial development variables.

According to Dastan et al. (2022) determined that economic/political and geopolitical risk had a deterrent effect on FDI in G20 countries in the 1996-2018 period, using Panel ARDL and causality methods.

Within the framework of the Belt and Road Initiative, Li et al. (2022) examined the effect of geopolitics on FDI inflows with Poisson Pseudo Maximum Likelihood regressions. The study stressed the importance of associating FDI and geopolitics. It was revealed that the relative bargaining power of the host countries was impacted depending on the importance of geopolitical risk.

Lu and Liu (2022) examined how FDI outflows from China to 154 countries in 2003-2020 were impacted by geopolitical risk. The findings demonstrated that extensive geopolitical risk negatively impacted FDI outflows. The energy sector was the most affected by this negativity.

In the study conducted by Marangoz (2022) to investigate the effect of economic, political and geopolitical risk on FDI in Turkey, the period of 1996-2019 was discussed.

As a result of the empirical analysis carried out within the scope of the MS-VAR model, it has been determined that geopolitical uncertainties have deterrent effects on foreign direct investments.

Nhuyen et al. (2022) assessed the effect of geopolitical risk on total factor productivity and FDI inflows in 18 developing economies during the 1985-2019 period using the SUR model and the Granger causality test. They determined that GPR had a negative impact on total factor productivity and FDI.

Özşahin et al. (2022) investigated the relationship between geopolitical risk and corruption with FDI in Turkey with some other independent variables using quarterly data covering the 2013-2020 period. The ARDL findings revealed that corruption control positively affected FDI inflows, whereas geopolitical risk adversely affected them.

Thakkar and Ayub (2022) examined how geopolitical risk affects globalization using an unbalanced panel dataset for 189 countries. In the analysis they carried out using annual data for the period 1948-2019, they took FDI as the globalization variable and also benefited from the per capita income variable. As a result of the analysis they carried out using the PPML (Pseudo - Poisson Maximum Likelihood) method, they determined that geopolitical risk is in a negative relationship with FDI.

Busy and Zheng (2023) investigated the effect of geopolitical risk on FDI in 19 emerging market economies between 2003 and 2019 using monthly data. In this context, they analyzed the impact of economic growth and various risk variables on FDI, as well as a number of technology and governance variables. According to the results obtained, they found that geopolitical risk has a negative effect on FDI.

Feng et al. (2023) determined that GMM and geopolitical risks significantly reduced FDI inflows in 45 countries during the period 2005-2019.

Yu and Wang (2023) examined the impacts of geopolitical risks on FDI flows in 41 countries between 2003 and 2020, considering market, strategic, and natural resources with the Fixed Effects Model. The test results showed that geopolitical risk could significantly impede FDI flows and this impact would differ according to development levels.

Empirical Analysis

Data Set

The current study investigated the effect of geopolitical risk on FDI with annual data for the period 1985-2020 in Turkey. In the econometric analysis applied to this end, foreign direct investment (LFDI) was accepted as the dependent variable, and geopolitical risk (GPR), economic growth (GDP), globalization (GLO), and inflation (INF) series were accepted as the independent variables. The econometric model created in line with this information is presented below;

$$LFDI = \beta_0 + \beta_1 GPR_t + \beta_2 GDP_t + \beta_3 GLO_t + \beta_4 INF_t + e_t \quad (1)$$

In equation (1), t refers to the time, and e_t refers to the error term. For the dependent variable LFDI, net foreign direct investment inflows in dollars were used and included in the analysis by taking the natural logarithm. The geopolitical risk index, prepared by Caldara and Iacoviello (2022), was used for the GPR variable constituting the basis of

the study. Data on the annual rate of change in real GDP were taken to represent the GDP variable. The general globalization index created by the Swiss Institute of Economics (KOF) was used for the GLO variable. Finally, the INF variable is the annual inflation rate computed according to the GDP deflator. Data on the LFDI, GDP, and INF variables were obtained from the World Bank database.

Econometric Method and Findings

In the empirical analysis section, first, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root test were used to research the stationarity of the series. Afterward, in accordance with the results of the stationarity tests, the long-run relationship was examined using the ARDL (the Autoregressive Distributed Lag) method, and then the short and long-run coefficient estimates were made.

Unit Root Analysis

It is known that economic variables face short or long term shocks and the effects of shocks are permanent. This contradicts the assumption that the series exhibit a stationary character around a trend. The trend created by permanent shocks prevents the series from approaching a certain value. Therefore, before estimating a time series, it is necessary to examine whether the series is stationary or not. When analysis is made with non-stationary series, it causes a spurious relationship to emerge and causes R2 to be high. It is understood whether a series is stationary or not by performing unit root tests. The most basic tests applied for this purpose are ADF and PP tests.

The ADF test hypotheses of Dickey-Fuller (1981) are given below:

H0: The series contains a unit root.

Ha: The series does not contain a unit root.

Estimates were made using the intercept and trend+intercept models in equations (2) and (3) below.

$$X_t = \beta_0 + \beta_1 X_{t-1} + \sum_{i=1}^k \gamma_i X_{t-i} + u_t \quad (2)$$

$$X_t = \beta_0 + \beta_1 X_{t-1} + \beta_2 trend + \sum_{i=1}^k \gamma_i X_{t-i} + u_t \quad (3)$$

Phillips and Perron (1988) prepared a test to overcome the shortcomings of the ADF test, considering possible variance and autocorrelation problems between the error terms. The PP test is expressed with the following equations (Phillips and Perron, 1988, p.338):

$$y_t = \hat{\mu} + \hat{\alpha} y_{t-1} + \hat{u}_t \quad (4)$$

$$y_t = \tilde{\mu} + \tilde{\beta} \left(t - \frac{1}{2} \lambda \right) + \tilde{\alpha} y_{t-1} + \tilde{u}_t \quad (5)$$

In both the ADF and PP tests, the fact that the statistical values calculated are larger than the critical values means that the series is stationary. Table 1 contains the results of the tests.

Table 1. ADF and PP Unit Root Test Results

Variables	ADF		PP	
	Intercept	Intercept+Trend	Intercept	Intercept+Trend
LFDI	-1.924 (0.318)	-1.780 (0.693)	-1.945 (0.309)	-1.855 (0.656)
ΔLFDI	-5.607 ^a (0.000)	-5.798 ^a (0.000)	-5.602 ^a (0.000)	-5.893 ^a (0.000)
GPR	-3.573 ^b (0.012)	-3.841 ^b (0.026)	-3.482 ^b (0.014)	-3.576 ^b (0.047)
GDP	-6.128 ^a (0.000)	-6.032 ^a (0.000)	-6.253 ^a (0.000)	-6.135 ^a (0.000)
GLO	-2.451 (0.136)	-1.395 (0.845)	-2.689 ^c (0.086)	-1.395 (0.845)
ΔGLO	-5.584 ^a (0.000)	-6.210 ^a (0.000)	-	-6.415 ^a (0.000)
INF	-1.867 (0.343)	-2.809 (0.204)	-1.709 (0.418)	-2.633 (0.269)
ΔINF	-7.818 ^a (0.000)	-6.045 ^a (0.000)	-8.359 ^a (0.000)	-8.279 (0.000)

Note: The letters a, b and c denote 1%, 5% and 10% significance levels, respectively. The Δ difference and the values in parentheses indicate the probability value.

Upon examining the unit root test results, it was found that the LFDI and INF variables had a unit root at the level according to both models and became stationary when the first difference was taken. According to the ADF test, the GLO variable becomes stationary when its first difference is taken in both the intercept and intercept+trend models. In accordance with the PP test, it is stationary at the level in the intercept model, whereas it is stationary at the first difference in the intercept+trend model. The GPR and GDP variables are stationary at level values according to both tests and both models. Accordingly, GPR and GDP variables have I(0) feature; It was determined that LFDI, INF and GLO variables have I(1) feature.

ARDL Analysis

The boundary test, which was developed by Pesaran et al. (2001) and can be used when variables are stationary at different degrees, is applied to test the presence of a long-run relationship between variables. If the presence of cointegration is detected by the boundary test, long- and short-run coefficient estimates are made depending on the ARDL (Autoregressive Distributed Lag) approach. According to the boundary test approach, the equation below was used to test the cointegration relationship:

$$\begin{aligned} \Delta LFDI = & \beta_0 + \sum_{i=1}^m \beta_{1i} \Delta LFDI_{t-1} + \beta_2 GPR_{t-1} + \beta_3 GDP_{t-1} + \beta_4 GLO_{t-1} + \beta_5 INF_{t-1} \\ & + \sum_{i=\frac{n}{m}}^m \beta_{6i} \Delta GPR_{t-1} + \sum_{i=\frac{n}{m}}^m \beta_{7i} \Delta GDP_{t-1} \\ & + \sum_{i=0}^m \beta_{8i} \Delta GLO_{t-1} + \sum_{i=0}^m \beta_{9i} \Delta INF_{t-1} + trend + u_t \end{aligned} \tag{6}$$

Equation (6) contains the difference (Δ) of the lags of the dependent and independent variables and the one-lagged values of the independent variables. Δ indicates the short-run dynamics and expresses the possible changes in the dependent variable (Süslü and Bekmez, 2010, p.99; Akel and Gazel, 2004, p.33). To investigate the cointegration relationship in the model, the appropriate lag length was determined as 4 according to the Schwarz information criterion.

Based on the information above, a boundary test is conducted to investigate the presence of a cointegration relationship. In the boundary test, while the basic hypothesis (H_0) is “There is no cointegration between the series.”, the alternative hypothesis (H_a) is “There is cointegration between the series.” If the F statistic obtained as a result of the boundary test is greater than the upper limit of the critical value, hypothesis H_0 is rejected, and the presence of a cointegration relationship is proven. Otherwise, it is accepted that there is no cointegration relationship. Table 2 contains the results of the boundary test.

Table 2. Boundary Test Results

	Value	Significance	Lower Limit	Upper Limit
F-statistic	11.147	10%	3.03	4.06
	4	5%	3.47	4.57
		1%	4.40	5.72

Note: k represents the number of independent variables. Critical values showing the lower and upper limit is taken from Table CI(V) in Pesaran (2001)’s article.

In accordance with the boundary test results, the F statistical value is greater than the upper limit critical value at the 5% significance level. Hence, hypothesis H_0 , indicating that there is no cointegration relationship, was rejected, and it was proven that there was a long-run relationship between the variables.

The ARDL model created to estimate the long-run relationship is given below:

$$LFDI_t = \beta_0 + \beta_1 t + \sum_{i=1}^m \beta_{2i} LFDI_{t-1} + \sum_{i=1}^m \beta_{3i} GPR_{t-1} + \sum_{i=1}^m \beta_{4i} GDP_{t-1} + \sum_{i=1}^m \beta_{5i} GLO_{t-1} + \sum_{i=1}^m \beta_{6i} INF_{t-1} + u_t \tag{7}$$

The model to be estimated in the long run was determined as ARDL(1,4,4,3). Table 3 contains the results of the long-run coefficients estimated on the basis of this information.

Table 3. ARDL(1,4,4,4,3) Long-Run Results

Dependent Variable: FDI				
Variables	Coefficient	Std. Error	t-stat	Prob.
GPR	-0.808 ^c	0.385	-2.098	0.062
GDP	0.086 ^a	0.015	5.637	0.000
GLO	0.038 ^c	0.018	2.170	0.055
INF	-0.009 ^a	0.002	-5.259	0.000

Note: The letters a, b and c denote 1%, 5% and 10% significance levels, respectively.

The long-run coefficient estimation results demonstrated that the GPR variable, which formed the basis of the study and represented geopolitical risk, had negative and statistically significant effects on foreign direct investments in line with expectations. Accordingly, a 1% increase in GPR reduces foreign direct investments by -0.808%. The impact of the GDP variable, representing economic growth, on foreign direct investments is positive and statistically significant. A 1% increase in GDP increases foreign direct investment inflows by 0.086%. Likewise, it was seen that the GLO variable included in the model as the representative of globalization also had positive impacts. It was revealed that a one-unit increase in the GLO variable increased foreign direct investment inflows by 0.038 units. Finally, it was found that the INF variable, indicating the inflation rate, had a negative impact on the dependent variable. Accordingly, a 1% increase in INF reduces foreign direct investment inflows by -0.009%. This result showed that inflation had a very low effect.

Table 4 contains the short-run coefficients calculated with the error correction model based on the ARDL approach.

Table 4. ARDL(1,4,4,4,3) Short-Run Results

Variable	Coefficient	Std. Error	t-stat	Probability
LFDI(-1)*	-0.893	0.153	-5.797	0.000
GPR(-1)	-0.721	0.349	-2.064	0.065
GDP(-1)	0.076	0.013	5.759	0.000
GLO(-1)	0.034	0.015	2.195	0.052
INF(-1)	-0.008	0.001	-4.872	0.000
D(GPR)	0.106	0.251	0.421	0.682
D(GPR(-1))	0.836	0.433	1.931	0.082
D(GPR(-2))	0.085	0.294	0.289	0.778
D(GPR(-3))	-0.663	0.229	-2.884	0.016
D(GDP)	0.024	0.005	4.516	0.001
D(GDP(-1))	-0.039	0.009	-4.143	0.002
D(GDP(-2))	-0.039	0.008	-4.759	0.000

D(GDP(-3))	-0.023	0.006	-3.548	0.005
D(GLO)	0.066	0.018	3.542	0.005
D(GLO(-1))	0.064	0.030	2.127	0.059
D(GLO(-2))	-0.015	0.033	-0.449	0.662
D(GLO(-3))	-0.092	0.030	-3.026	0.012
D(INF)	-0.001	0.001	-0.826	0.428
D(INF(-1))	0.003	0.001	2.091	0.062
D(INF(-2))	-0.002	0.001	-1.833	0.096
@TREND	0.004	0.018	0.198	0.846
C	7.709	1.702	4.528	0.001
CointEq(-1)	-0.893	0.101	-8.833	0.000

The error correction coefficient is statistically significant and negative, as expected, which indicates that the error correction mechanism works. The estimated value of the coefficient is -0.893. According to this result, it is said that approximately 0.893 of the short-run deviations in foreign direct investments disappear every year. In other words, since the adaptation coefficient is very close to 1, the long-run equilibrium can be regained in a short time of one period. Using the diagnostic tests, it was researched whether there was a normal distribution, heteroscedasticity, autocorrelation, and model-specification in the model. Table 5 contains the results.

Table 5. Diagnostic Test Results

Tests	X^2_{NORM}	X^2_{BG}	X^2_{WHITE}	X^2_{RAMSEY}
Statistics	0.411 (0.813)	1.009 (0.341)	1.005 (0.522)	0.301 (0.770)

Note: X^2_{NORM} , X^2_{BG} , X^2_{WHITE} , X^2_{RAMSEY} are Jarque-Bera normal distribution, Breusch-Godfrey autocorrelation test, Breusch-Pagan-Godfrey heteroscedasticity test and Ramsey Reset model-specification test, respectively.

The ARDL estimation results showed that the model did not have heteroscedasticity and autocorrelation problems and the error term was normally distributed. Furthermore, the Ramsey Reset test results indicated that there was no model-specification error. Additionally, CUSUM and CUSUMSQ graphs, which use the squares of the reversible error terms, were utilized to examine the model's stability, in other words, to investigate whether there was a structural break in the variables. Figure 1 presents the relevant test results to determine the model's stability.

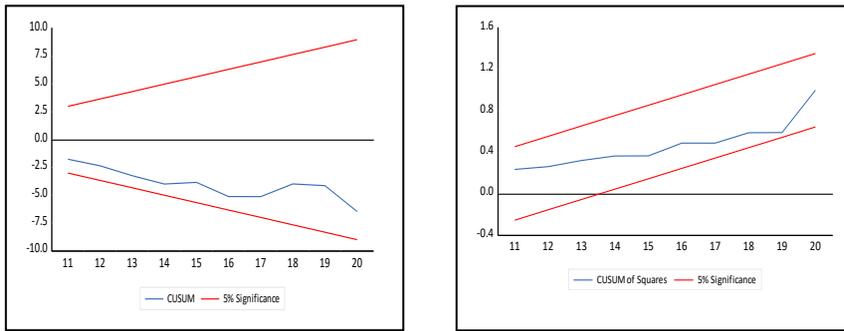


Figure 1. CUSUM and CUSUMSQ Graphs

If the statistics of the CUSUM and CUSUMSQ tests are within the critical limits at the 5% significance level, all coefficients in the error correction model are accepted as stable. In other words, the established ARDL model has a stable structure. With the graphs, it was determined that there was no structural break in the variables and, therefore, the model had a stable structure.

Discussion and Conclusion

It is accepted that foreign direct investments have critical importance in a country's sustainable economic growth and development since they reduce the problem of capital insufficiency, increase production and employment, and reduce the foreign exchange gap. Therefore, countries have entered into a race with each other to attract the maximum level of FDI and make many regulations in political, legal, and economic fields. Studies in this field reveal that, in addition to the economic, political, and legal factors influencing the inflow of FDI in the country, geographical characteristics such as proximity to the market and raw materials and the international cyclical situation are also effective.

The study investigated the effect of geopolitical risk, which has been frequently examined recently, on FDI in Turkey. In this respect, the ARDL method, one of the time series techniques, was applied using annual data for the period 1985-2020. The empirical analysis results demonstrated the significant effects of geopolitical risk on FDI. Accordingly, in line with other studies in the literature, it was revealed that increased geopolitical risk reduced FDI inflows. Furthermore, it was determined that inflation, which was added to the analysis as a control variable, negatively affected FDI. It was observed that the increased levels of economic growth and globalization increased FDI. These findings revealed that Turkey, which faces high geopolitical risks due to its geographical location, should behave more sensitively in its economic and political relations, especially with neighboring countries and EU countries. In addition, Central Asian Turkic Republics, which gained their independence after the collapse of the Soviet Union, are regions with raw material resources in energy and foreign direct investments are concentrated in this area. In other words, they can be considered geopolitical risk. As stated before, Arab countries in the Middle East and the Russia-Ukraine War in the north cause the risk to affect Turkey. As a result, implementing

policies that reduce the level of geopolitical risk in international relations will ensure a stable and safe environment for foreign investors and accelerate FDI inflows.

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