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The Relationship Between Foreign Direct Investments and CDS Premiums in Türkiye: Time-Varying Causality Test (2011-2023)

(Research Article)

Türkiye'de Doğrudan Yabancı Yatırımlar ile CDS Primleri Arasındaki İlişki: Zamanla Değişen Nedensellik Testi (2011-2023)

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ABSTRACT

Foreign direct investment (FDI) is used as an important policy tool in providing the funds needed by developing countries for development purposes. Countries with insufficient capital are in a race to attract foreign capital to their countries through various political, economic and legal regulations. This study econometrically investigates the relationship between FDI and CDS premiums in Türkiye and analyses whether there is a relationship between the monthly frequency data between 2011-2023. In order to determine the relationship between the variables, the stationarity of the variables should be determined first. "Lee and Strazicich (2003)" unit root tests, which take into account structural breaks, were applied to the data. The determination of whether there is causality between the variables, and if there is a causality relationship, the determination of the direction of the causality relationship is tested by mutual "Granger Causality" and "Time-Varying Causality" test methods. As a result of the study, no causality relationship was found from FDI to CDS premiums and from CDS premiums to FDI at 5% significance level.

Anahtar Kelimeler:
Doğrudan Yabancı Yatırımlar, CDS, Zamanla Değişen Nedensellik Testi, Granger Nedensellik Testi

ÖZET

Doğrudan yabancı yatırımlar (DYY) gelişmekte olan ülkelerin kalkınma amacı ile ihtiyacı olan fonları sağlamada önemli bir politika aracı olarak kullanılmaktadır. Sermaye yetersizliği olan ülkeler çeşitli politik, ekonomi ve hukuki düzenlemeler ile ülkelerine yabancı sermaye çekme yarışındadırlar. Bu çalışmada, Türkiye'de DYY ve CDS primleri arasındaki ilişkinin ekonometrik olarak araştırılmış ve 2011-2023 tarihleri arası aylık frekanstaki veriler arasında bir ilişkinin bulunup bulunmadığını incelemiştir. Değişkenler arasındaki ilişkileri tespit etmek için ilk olarak değişkenlerin durağanlıklarının belirlenmesi gerekmektedir. Verilere yapısal kırılmaların dikkate alındığı "Lee ve Strazicich (2003)" birim kök testleri uygulanmıştır. Değişkenler arasında nedenselliğin olup olmadığı, nedensellik ilişkisi mevcutsa yönlerinin tespit edilmesi karşılıklı olarak "Granger Nedensellik" ve "Zamanla Değişen Nedensellik" testi yöntemleriyle test edilmiştir. Çalışma sonucunda %5 anlamlılık düzeyinde DYY'den CDS primlerine ve CDS primlerinden DYY'ye doğru herhangi bir nedensellik ilişkisi bulunamamıştır.

1. INTRODUCTION

Capital, which is a limited factor of production, is important for all countries, but it is much more important for developing countries, including Türkiye. Capital analyses the factors of low risk and high return together and determines the country in which it will invest within this framework. As a result of the liberalisation of capital movements, the intensification of capital movements between countries facilitates developing countries. Countries facing the problems of inadequate financing, lack of domestic savings and/or technological backwardness tend to use external resources more in order to make their development policies sustainable.

As a part of the financial liberalisation that started after trade liberalisation, the liberalisation of capital movements gained great momentum in the 1980s all over the world. With globalisation, international production and foreign direct investments have tended to increase. Foreign direct investments, which create technological innovation and employment as a source of capital for host countries, have been positively affected by the developments in economic and social life. In this process, while multinational companies prefer to make their production in the countries they find advantageous, developing countries support the entry of foreign direct investments into the country as they want to increase their economic growth. Especially in developing countries, it is accepted that there is a positive relationship between FDI, which increases resource utilisation, infrastructure investments and technological development, and economic growth. According to the neoclassical theory, foreign direct investments can increase economic growth by increasing the amount and efficiency of total investments. This is because foreign direct investments lead to an increase in capital formation and employment, increase exports of capital goods, bring in resources such as knowledge and experienced managers, contribute to the development and diffusion of technology, and thus, economic growth is supported by increasing productivity.

The economic entry of foreigners into a country can be realised in the form of acquiring securities from money and capital markets, as well as establishing a new production facility in this country, partially or fully purchasing a domestic firm or cooperating with domestic firms through various agreements. While the transformation of foreigners into actors by acquiring assets in the financial markets of the host country is called portfolio investments, the use of assets such as capital, technology, knowledge and experience in a permanent economic venture in the host country is called Foreign Direct Investment (FDI) (Kara, 2019). Although the history of foreign investments goes back much further, with the impact of the global conjuncture that emerged after the Second World War and the economic globalisation that gained a different dimension especially after the 1980s, international capital movements for investment purposes have accelerated worldwide and the concept of FDI in its known meaning has started to take place more intensively on the agenda of both economic units and economists.

However, the fact that national savings are generally insufficient in underdeveloped and developing countries is an obstacle to the growth of these countries. Therefore, these countries have directed all their attention to foreign savings, especially FDIs. The inflow of FDIs has positive effects on national economies in terms of overcoming the foreign exchange bottleneck, increasing domestic savings, technological transfer and utilisation of economies of scale. With the accelerating globalisation process, the positive effects of foreign investments have caused many economies, which were distant from this issue in the past, to open their borders to the outside world (to end foreign exchange controls) and to compete with each other in attracting investments to their own countries (Batmaz and Tunca, 2005).

A large portion of FDIs are made by multinational companies. These companies are enterprises that can produce in more than one country at the same time with the enterprises they establish in different countries. In addition, these enterprises are organisations that control production in more than one country. The fact that the conditions shaping the investments of multinational companies are different causes foreign direct investments to be divided into types. In this context, a multinational company's partnering with local companies, establishing a new company with its ownership, acquiring an existing company and forming a strategic alliance with one or more companies are considered among the types of foreign direct investment (Seyidoğlu, 2015).

In order for FDIs to be realised, economic, political, cultural, legal, social stability conditions as well as the element of confidence in the host country should encourage the investment environment. The arrival of foreign direct investments in a country is closely related to its internal dynamics. In its 2019 investment report, UNCTAD analysed the factors determining foreign direct investments. These factors are the economic attractiveness of the domestic market, low financial liability and political stability (UNCTAD, 2019).

The investment decision is reached as a result of the evaluations in the fundamental and technical analysis processes of foreign direct investments. In international equity markets, investors take into account the risks associated with countries and firms. One of the most important indicators that investors can use in risk assessments is credit default swaps (CDS). Since CDS markets are dynamic markets where all kinds of information that may affect financial markets are quickly reflected in CDS prices with the participation of many buyers and sellers, CDSs are an important indicator for international equity investors (Şenol et al., 2023).

CDS is an indicator used in the assessment of sovereign credit risk. Except for the contract made between the borrower and the lender, insuring the contract to a third party against the risk situation of the borrower, in other words, transferring the risk to be encountered in case of default of the loan is called credit default swap. By insuring the related debt, the lender reduces its risk. The party that carries out insurance transactions related to this debt, on the other hand, earns premium income in return for the contract (IMF, 2013). In other words, CDSs are insurance instruments that emerged in the late 1990s and early 2000s to transfer the risks arising from the balance sheets of commercial banks to third parties, mainly insurance companies and investors (Mateev, 2019). CDS premiums have recently become an important indicator in financial markets. Since CDSs are widely used in the analysis and valuation of financial instruments such as exchange rates, stocks, bonds and bills, CDSs have become an important risk indicator for countries, firms and markets.

Studies on CDSs provide important clues for a better understanding of sovereign credit risk and allow for a different assessment of credit risk compared to traditional instruments such as bonds and swaps studied in the literature. In fact, CDSs, which date back to the 90s, have been used extensively in financial markets to hedge credit risk, and as the number of reference assets traded increases, the liquidity and diversity in the market also increase (Cossin and Jung, 2005).

Until the 2008 global financial crisis, sovereign credit ratings were the most commonly used indicator to measure a country's credit risk. Criticisms that credit rating agencies were insufficient in predicting the crisis increased the demand for different indicators for measuring sovereign credit risk, which show the most up-to-date market situation and can quickly adapt to changing conditions. During the 2008-09 Global Financial Crisis, credit ratings issued by popular international rating agencies such as S&P, Fitch and Moody's, which raised concerns in the markets about the independence of these agencies, contributed to CDS premiums becoming one of the most widely used measures of sovereign credit risk in recent years.

Studies indicate that a significant portion of sovereign CDS premiums is explained by general factors such as investors' risk appetite and global economic indicators. An increase in a country's creditworthiness, coupled with an increase in capital availability, provides financial relief to these countries, which in turn reduces CDS premiums written on sovereign debt. Moreover, as a country's creditworthiness improves, its attractiveness in the markets increases, which may affect the capital flows of other countries and cause movements in CDS premiums (Ismailescu and Kazemi, 2010).

Since it is not possible for a country, as opposed to an institution, to cease to exist in the event of default, the inability to repay a loan, i.e. the realisation of sovereign credit risk, often takes the form of restructuring or non-recognition of external debt (Pan and Singleton, 2008). Country credit risk is essentially a combination of all economic, financial and political risks that a country faces (Beers and Cavanaugh, 2008). At this point, changes in CDS premiums provide investors with important clues about the direction in which sovereign risk moves.

The intensive economic relations between countries in the globalising world and the increasing interaction between the financial markets of these countries bring the issue of foreign direct investment to the forefront in the literature. The savings problem in developing countries is tried to be compensated by the surplus funds in developed countries. The movements of these funds are seriously affected by the economic, political and social structure of the country. In particular, it is observed that many of the studies in question are between country risks and foreign direct investments. Therefore, the aim of this study is to econometrically investigate the relationship between foreign direct investments and CDS premiums in Turkey. Considering the ease of access to data in the study, estimation results were obtained with the monthly data of the selected variables for the period 2011-2023. It is tried to reveal whether there is a relationship between foreign direct investments and CDS variables. In the next section of the study, firstly, literature studies on the subject are mentioned. Then, the data, methodology and findings used in the study are presented. Finally, the evaluation on the subject is made and the findings obtained from the application are explained. Finally, the evaluation on the subject is made and the findings obtained from the application are explained.

2. LITERATURE REVIEW

Acedemic Source Complete, Jstor, Taylor & Francis, SpringerLink and Web of Science databases were searched in order to analyse the relationship between FDI and CDS premiums. A very limited number of studies have been found in the literature on the relationship in question. When the literature is analysed, it is seen that in most of the studies, a single country is examined on a monthly basis or more than one country is examined in annual periods due to data shortage.

Studies on the relationship between FDI and CDS premiums are Fei, Fuertes and Kalotychou (2017), Koy and Karaca (2018), Kahıloğulları (2018), Yıldırım and Sakızcı (2019), Sevil and Ünkaracalar (2020), İlter and Gök (2021), Şenol, Gülcemal and Koç (2023). Except Fei et al. (2017), all of these studies are related to Türkiye.

Fei et al. (2017) investigated the relationship between the Europe 600, Europe 600 financial and Europe 600 automobile and parts indices and iTraxx CDS premiums for the same indices for the period 9 September 2005 - 11 March 2011. In the study, it is determined that there is a negative and significant movement between CDSs and stock market index returns, the relationship varies over time and is non-linear.

Kahıloğulları (2018) conducted a study on the Türkiye sample with data for the period January 2005 - December 2017 and found that there is a negative relationship between foreign portfolio investments and CDS premiums both in the short run and in the long run. Similarly, Yıldırım and Sakızcı (2019) investigated the relationship between CDS risk premiums and net portfolio investments with quarterly data for the period January 2010 - September 2018 and found that there is a negative relationship between CDS premiums and foreign portfolio investments in the short run and causality from CDS premiums to foreign portfolio investments.

Koy and Karaca (2018) conducted a study on the factors affecting international portfolio investments in Türkiye during contraction and expansion periods with data for the period 2013-2016 and found a negative relationship between net portfolio investments and CDS premiums. Sevil and Ünkaracalar (2020) investigated the relationship between portfolio investments and CDS premiums with quarterly data for the period 2010-2018. In the study, it is determined that there is a long-run relationship between CDS and portfolio investments, the coefficient of this relationship is negative, and there is causality from portfolio investments to CDS premiums. İlter and Gök (2021) investigated the relationship between CDSs and foreign portfolio investments with Turkish data for the period 2005Q4 - 2019Q3 and found a mutual causality relationship between CDS premiums and foreign portfolio investments. Şenol et al. (2023) investigated the relationship between credit default swaps (CDS), a credit risk premium indicator, and foreign equity investments. In the study, a Fourier Granger causality analysis was performed using 5-year CDS premiums and foreign equity investments data for Türkiye for the period 11 September 2020 - 24 June 2022. In the study, a unidirectional causality was found between CDSs and foreign equity investments, that is, from CDS premiums to foreign equity investments. Fei, Fuertes and Kalotychou (2017), Koy and Karaca (2018), Kahıloğulları (2018), Yıldırım and Sakızcı (2019), Sevil and Ünkaracalar (2020), İlter and Gök (2021), Şenol et al. (2023), there is a relationship between CDSs and foreign portfolio investments, either cointegration or causality, and in the estimates of the degree of the relationship in all studies except İlter and Gök (2021), there is a negative relationship between CDSs and foreign portfolio investments.

Öztürk et al. (2018) examined the relationship between foreign direct investments and economic growth in Türkiye with the help of time series analyses for the period between 1974 and 2016. Engle Granger Cointegration test was applied to determine the existence of a long-run relationship between FDI and economic growth variables. In order to determine the direction of the relationship between the series, Granger Causality analysis was performed and no causality relationship was found.

Acet et al. (2020) aimed to determine the relationship between foreign direct investments and economic growth through the example of Central Asian countries. They used the Granger causality test to determine the relationship between the variables. As a result of the study, a double causality relationship was found between FDI and economic growth. The effect of FDI on GDP was found to be positive.

Syzdykova (2020) aimed to determine the existence of the relationship between GDP and FDI in transition countries. According to the results of the panel co-integration test, FDI, gross fixed capital formation and economic growth variables were found to move together in the long run.

Keskin (2021) analysed the impact of sovereign credit ratings on portfolio investments and FDI in Türkiye. In the study, the effect of credit ratings assigned to Türkiye by Standard and Poor's, Moody's and Fitch, the three major credit rating agencies dominating the international market, on foreign direct investments and portfolio investments in the 1998:Q1-2019:Q3 period was investigated with Johansen and ARDL (Autoregressive Distributed Lag) cointegration methods based on bounds test. As a result of the analysis, no significant relationship was found between credit ratings and foreign direct investments, while the effect of credit ratings on portfolio investments was found to be significant and positive. Although credit ratings positively affect portfolio investments, the degree of the effect is weak. The findings indicate that the credit ratings assigned to Türkiye are not a sufficient and sufficiently effective factor in directing capital flows.

Saygın (2021) analysed the relationship between current account deficit and FDI for MIST countries. In the study, he conducted a panel cointegration test for MIST (Mexico, Indonesia, South Korea and Türkiye) countries with data for the period 1990-2019. As a result of the analysis, a long-run relationship was found between the variables. In order to reveal the effect of the long-run relationship, the average group dynamic least squares (DOLSMG) estimator was utilised. As a result of the analysis, it is concluded that foreign direct investments have a negative effect on the current account deficit except for S. Korea. Trade openness, another variable analysed in the analysis, is found to increase the current account deficit. It is concluded that a 1-unit increase in trade openness increases the current account deficit by 0.11 units.

Matsumoto (2022) developed an economic model to examine the determinants of the optimal pace of foreign reserve accumulation by developing countries. In the model, reserve accumulation is found to attract real FDI inflows. According to the model, one of the main determinants of the optimal pace of reserve accumulation is the entry cost for foreign direct investment.

Sarı and Ilgın (2022) investigated the relationship between FDI and macroeconomic variables using panel data analysis for G7 countries. As a result of the study, it is determined that there is a negative and significant relationship between inflation and total reserves and FDI, and a positive and significant relationship between gross domestic product and FDI in the long run in G7 countries.

In their study, Şeker and Şentürk (2022) examined the relationship between FDI and international trade through the example of N-11 countries. The long-run relationships between the variables were tested by panel cointegration analyses. As a result of the study, a long-run relationship was found between the international trade of N-11 countries and both inward FDI and outward FDI.

Aztimur and Kaya (2022) examined the relationship between FDI and exports in Turkey between 1970-2019. They examined the cointegration relationship between the two variables with the Fourier SHIN test and found a cointegration relationship between FDI and exports. A cointegration relationship was found between FDI and exports. According to the causality test result between the series, they found causality from FDI to exports. No causality relationship was found from exports to FDI. Dynamic Least Squares (DOLS) method was used for long run coefficients. The obtained long-run coefficient is positive and statistically significant. Accordingly, they concluded that a 1% increase in foreign investments increases exports by approximately 0.67%.

In their study, Şeker and İşgüven (2022) analysed the impact of sovereign credit risk on international trade and foreign direct investments for Türkiye. Using the ARDL bounds test, they found that increases in the credit default risk premium have a negative long-run effect on foreign direct investments and imports to Türkiye. As a result of the analyses conducted with the frequency-domain causality test, it is found that there is a unidirectional causality relationship from the credit risk premium to Türkiye 's import volume in the medium and long run, and to foreign direct investment in the medium term. As a result, although the credit default risk premium is an indicator of short-term debt repayment obligations, it is also an important indicator for firms planning exports or foreign direct investment to Türkiye to predict the economic situation in the medium and long term.

3. RESEARCH DESIGN AND METHODOLOGY

The relationship between foreign direct investments and CDS premiums is investigated by using time series analyses. Time series analyses, which were initially used for economic researches, have gained importance and started to be used in financial studies.

3.1. Purpose of the Study

The aim of the study is to econometrically investigate the relationship between foreign direct investments and CDS premiums in Türkiye and to examine whether there is a relationship between the monthly frequency data between 2011-2023.

3.2. Data Set

This study tests the relationship between FDI and CDS premiums in Türkiye. The data set of the study consists of Foreign Direct Investment (FDI) and CDS premiums (Credit Default Swaps) variables for the period 2011-2023. Time series in US Dollars are obtained from the "Central Bank of the Republic of Turkey Electronic Data Distribution System" database and investing.com. The logarithm of each of the data used in the study was taken and used. Thus, the measurement differences between the series were tried to be minimised.

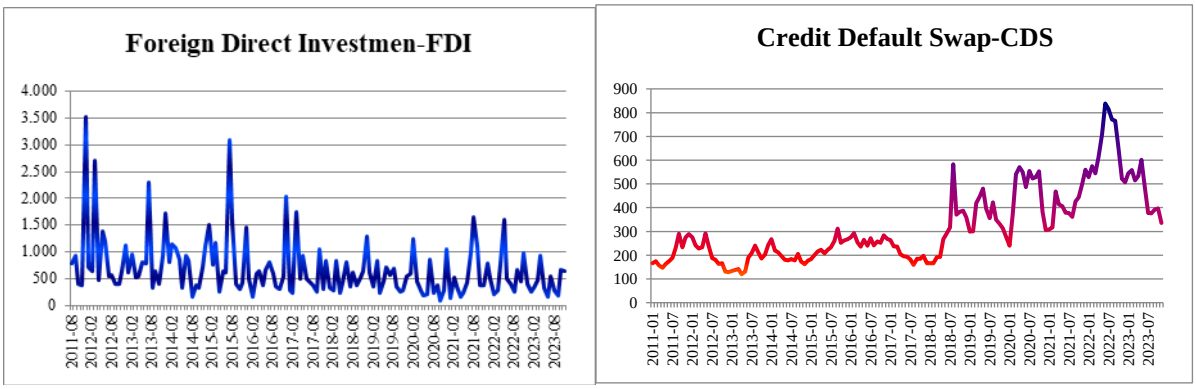

Figure 1. Time Series Graphs

When the time series consisting of monthly data between 2011 and 2023 are analysed, it is observed that FDI decreases in periods when Türkiye 's CDS premiums increase, and conversely, FDI increases in periods when CDS premiums decrease or tend to decrease.

3.3. Hypotheses of the Research

In the research, the hypotheses to be tested by taking into account the break structure of the series and whether the series have a trend or not in the investigation of whether there is a relationship between the variables are determined as follows:

H_0: There is no causality relationship between FDI and CDS premiums.

H_1: There is a causality relationship between FDI and CDS premiums.

3.4. Methodology of the Research

In this study, time series analyses are used to test the relationship between foreign direct investments and CDS premiums in Türkiye. In order to determine the relationship between the variables, the stationarity of the variables should be determined first. "Lee and Strazicich (2003)" unit root tests, which take into account structural breaks, were applied to the data. The determination of whether there is causality between the variables and if there is a causality relationship, the determination of the direction of causality is mutually tested with the "Granger Causality" method.

3.4.1. Lee-Strazicich Unit Root Test

This unit root test, which allows for the presence of an endogenously determined structural break, is the LM unit root test based on two models according to breaks in the constant (Model A) and trend (Model C). Lee and Strazicich (2013) stated that, contrary to Zivot and Andrews (1992), Perron (1997) and Vogelsang and Perron (1998), which are unit root tests developed in the presence of structural breaks, the rejection of the null hypothesis does not require the rejection of the unit root, but implies the rejection of the unit root without structural breaks (Tıraşoğlu, 2014). The equation of the Lagrange Multipliers (LM) unit root test with two breaks is as follows:

$$y_t = \delta Z_t + e_t \qquad e_t = \beta e_{t-1} + \varepsilon_t \qquad (1)$$

Where *Z*t denotes exogenous variables and *e*t denotes the error term. In this test that allows for the presence of a structural break, Model A is known as the Crash model and allows for a level break under the alternative hypothesis. Model A is defined as $Z_t = [1,t,D_t]$, where $D_t = 1$ for $t \geq T_B + 1$ and $D_t = 0$ for other cases. T_B denotes the time period of the structural break. Similarly, Model C allows a break in the level and slope under the alternative hypothesis and is denoted by $Z_t = [1, t, D_t, DT_t]$, where $DT_t = t\text{-}T_B$ for $t \geq T_B + 1$ and $DT_t = 0$ for the other cases. According to LM tests, unit root test statistics with structural break are obtained by regression equation (3) (Yıldırım, 2006:100):

$$\Delta y_t = \delta' \Delta Z_t + \phi \tilde{\delta}_{t-1} + u_t \qquad (2)$$

In the equation $\tilde{\delta}_t = Yt - \widetilde{\psi x} - Zt\tilde{\delta}$, t= 2, ...T. $\tilde{\delta}$ denotes the coefficients obtained from the regression of ΔY on ΔZ_t. $\widetilde{\psi x}$ is obtained by $Y_1\text{-}Z_1\tilde{\delta}$. In the Lee and Strazicich (2004) unit root test, the null hypothesis of a unit root is expressed by $\phi = 0$ and the LM test statistic, $\tilde{\tau}$: $\phi = 0$ The t statistic that tests the null hypothesis $\tilde{\tau}$: $\phi = 0$. In this test, T_B is chosen as the year that yields the minimum unit root t-statistic for possible break points to denote the time of the break; $Inf\,\tilde{\tau}(\tilde{\lambda}) = \text{ınf}\,\tilde{\tau}(\tilde{\lambda})$, where $\lambda = \left(\frac{T_B}{T}\right)$ The search for the structural break point is usually performed in the truncation region, with T being the sample size (Yıldırım, 2006:100).

3.4.2. Causality Analysis

The Granger causality relationship means that the independent variable X in the regression has a causal relationship with the dependent variable Y. For this to be the case, two basic conditions must be met. The first one is that the dependent variable X mediates the prediction of the independent variable Y. The second assumption is that Y will not be effective in predicting X. This is called unidirectional causality. In causality tests, the direction of the tests is important, that is, it is very important in determining whether the variables are dependent or independent. The direction of causality is very important in understanding whether the relationships between two or more variables are unidirectional, bidirectional or no relationship at all (Granger, 1969, pp.424-438, Kennedy, 2006, pp. 81-82, Gujarati, 2009, pp. 620-623). Granger causality test allows the causality analysis between dependent and independent variables in the "short run" period.

$$y_t = a_1 + \sum_{i-1}^{n} \beta_i x_{t-i} + \sum_{j=1}^{m} Y_j\, y_{t-j} + e_{1t} \qquad (3)$$

$$x_t = a_2 + \sum_{i-1}^{n} \Theta_i x_{t-i} + \sum_{j=1}^{m} \delta_j\, y_{t-j} + e_{2t} \qquad (4)$$

If H_o hypothesis is rejected, it means that X has a Granger causality relationship with Y. In the Granger causality test, there can be both a direction from X to Y and a direction from Y to X. This is called bidirectional causality. It is denoted as X↔Y. If both H_0 hypotheses are rejected, it is possible to say that there is a bidirectional causality between X and Y variables. In order to conduct Granger causality test between X and Y series, the covariance of both variables should be stationary and stochastic.

In Granger causality, iterative estimation methods are necessary to allow for time variation and to reveal the dates of the changes. A set of test statistics for Granger causality is calculated, one for each time period of interest, and this information is used for interpretation. There are three algorithms that generate a set of test statistics for this purpose. These algorithms are forward expanding window (FE), rolling window (RO) and iteratively evolving (RE) algorithms. The starting point of each sub-sample in this iteration is the initial data point. The FE algorithm results in a set of Wald test statistics. In the RO algorithm, the window size is rounded one observation at a time through the forward observation and the Wald test statistic is calculated for each window (Swanson, 1998). The RE algorithm runs a test regression for each possible sub-sample providing a common endpoint for all sub-samples. This procedure is repeated, taking the relevant observation as each point in the sample, depending only on the minimum window size. As a result, every observation in the sample, except the first sub-sample that defines the minimum window size, is associated with a set of Wald test statistics. As can be seen, the RE algorithm covers special cases of both FE and RO iterations (Arora and Shi, 2016).

The time-varying Granger causality approach involves the estimation of the VAR model using moving windows of different lag lengths, independent of the time series properties of the variables. In order to efficiently display the large number of Wald statistics obtained, the results are reported graphically. In other words, FE, RO and RE statistics are displayed graphically and can be compared with robust critical values. These estimates can be used to identify periods in which the Granger causality relationship changes significantly. The estimated start date of a change is defined as the first time the test statistic exceeds the critical value. Subsequent changes are defined in a similar way (Erer, 2022).

By means of the time-varying causality test, the bootstrap causality test is applied one by one for each observation instead of applying it to the entire data range analysed at once. In this way, instead of making a general judgement about the whole period, it is revealed that there may be different causality findings in different weeks. According to this method, also known as "Rolling Windows", both test statistics and critical values are normalised by bootstrap simulation. According to the main hypothesis of the model, in the graphs obtained, periods when the test statistics are below the critical values indicate the absence of causality. According to the alternative hypothesis of the model, periods where the test statistics are above the critical values indicate the presence of causality. In this way, it will not be possible to say that the main or alternative hypothesis can be accepted with certainty for the entire time interval analysed. The results obtained periodically through this method may differ.

4. RESEARCH FINDINGS

This section of the study presents the results of the tests and the findings obtained in order to reveal the relationship between foreign direct investments and CDS premiums.

4.1. Lee-Strazicich Unit Root Test Results

Within the scope of the research, Model C is taken as a basis since it expresses the model of break in constant and trend. While testing the stationarity of the series, firstly, it is determined whether they are stationary at the level. Differences of the non-stationary series were taken and LS unit root tests were performed again. If the absolute values of the test statistic values are greater than the critical values, the null hypothesis of LS unit root is rejected, whereas if the absolute values are less than the critical values, the null hypothesis is not rejected. The findings obtained are shown in Table 1.

Table.1 Lee-Strazicich Unit Root Test Results

Lee Strazicich (Model C)						
Variables	**Level Test Statistic**	**Level Break Date**	**Critical Value**	**1. Difference Test Statistic**	**1. Difference Break Date**	**Critical Value**
logFDI	-4.1781*	02/2012	-3.41	-	-	-
logCDS	-4.0566*	07/2018	-3.41	-	-	-

** is significant at the 5% level. Critical values are critical values at 5% level.*

According to the results of the Lee-Strazicich unit root tests, FDI and CDS variables were found to be stationary at level values.

4.2. Determination of Lag Length

After determining that the series are stationary at level value, the appropriate lag length was determined in order to apply other analyses. Information criteria were used to determine the optimal lag level. In Table 2, LR

(Likelihood), FPE (Final Prediction Error), AIC (Akaike Information Criterion), SC (Schwarz Information Criterion), HQ (Hannan-Quinn Information Criterion) information criteria are given and the optimal lag length is determined as "2".

Table 2. Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1.583574	NA	0.030378	2.181733	2.222420	2.198265
1	1.989670	7.000642	0.000248	-2.625402	-2.503343	-2.575808
2	2.165561	**33.98158***	**0.000206***	**-2.810287***	**-2.606856***	**-2.727631***
3	2.193529	5.327259	0.000210	-2.793917	-2.509114	-2.678198
4	2.229096	6.677850	0.000211	-2.787885	-2.421710	-2.639104
5	2.266996	7.012779	0.000212	-2.785028	-2.337481	-2.603185
6	2.279454	2.271276	0.000220	-2.747556	-2.218636	-2.532650
7	2.305596	4.694949	0.000224	-2.728702	-2.118410	-2.480734
8	2.334881	5.179540	0.000228	-2.714123	-2.022459	-2.433092

4.3. Granger Causality Test Results

The Granger causality test analysed whether there is causality between the series. The test was carried out reciprocally. While determining the causality between the series, the lag length (k) of the series was found according to the "Akaike Information Criterion (AIC)" and the maximum degree of integration (dmax) was found according to the LeeStrazicich (LS) unit root test. Then, "Wald Statistic" was applied to (k) lagged values of this model and it was determined whether there is a causality relationship between the variables.

Table 3. Granger Causality Test Results

Independent Variable	Dependent Variable	K	Chi-Square Test Statistic	Chi-Square P-Value	Relationship and Direction
logCDS	logFDI	3	0.6153	0.6062	no relationship
logFDI	logCDS	3	1.3281	0.2676	no relationship

When Table 3 is analysed, no causality relationship could be detected from FDI to CDS premiums and from CDS premiums to FDI at the 5% significance level. In this case, H0 hypothesis cannot be rejected.

4.4. Time-Varying Causality Test Results

The results of the time-varying causality test used to measure the time-varying effect between the variables with the rolling claws method are shown in Graph a. In addition, for the analysis, 10000 bootstrap values, with a maximum lag length of 2 lags, were calculated with the help of the SBC criterion.

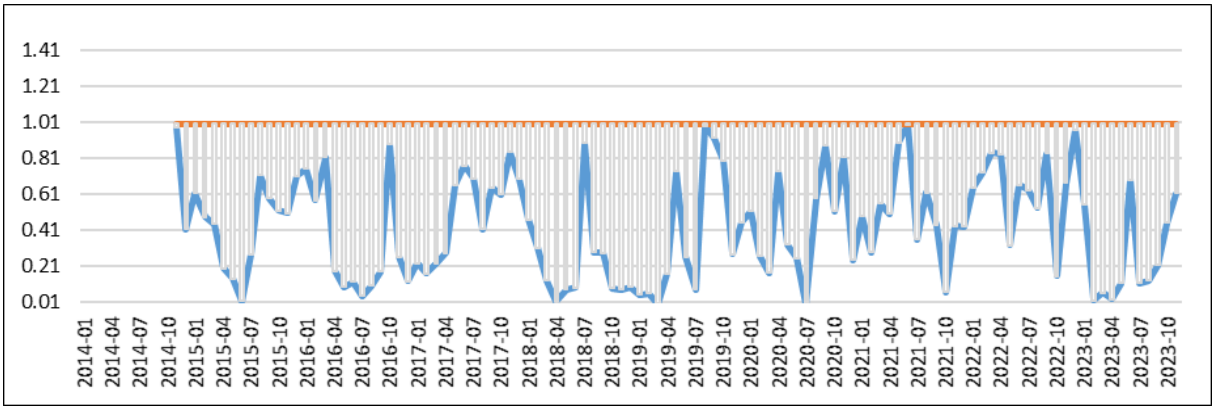

Figure 2. Time-Varying Causality Test Results

As can be seen in Figure 2, it is determined that there is no econometric causality relationship from CDS premiums to the FDI dependent variable within the analysed time period. It was observed that the prob value remained below 1 throughout the analysed periods. In this case, H_0 hypothesis cannot be rejected.

5. CONCLUSION

Foreign direct investments will ensure economic growth, close the savings deficit and open up investments under favourable conditions, especially for developing countries where national income and savings rates are low. In this

way, FDIs will prevent the risks and uncertainties arising from the volatility in domestic investment and consumption expenditures with the support of strengthening the economic structure. In addition, it will contribute positively to growth by playing a major role in the fund distribution and production efficiency of the economy by directing the low savings and low investment cycle of countries due to low income to foreign savings. For these reasons, FDIs act as a lifeline for the growth of underdeveloped/developing economies that do not have sufficient capital accumulation and a certain technological level.

With the globalisation process, the intensity of economic relations between countries has gradually increased. Accordingly, there has been a significant increase in the international trade volumes and foreign direct investments of countries. Various indicators have been needed to ensure that increasing economic relations are more secure for firms engaged in trade and investment. The CDS premium is an important indicator for the fulfilment of debt payment obligations in a country and has become an important factor for firms engaged in international trade and investment.

FDIs have become important in terms of economic structure and financial markets due to the foreign trade deficit, current account deficit, insufficient capital stock and low savings rate in the Turkish economy. CDS is an important risk indicator used in the analysis and valuation of financial markets and financial instruments as well as being a credit risk indicator that has developed rapidly after the 2000s. This study econometrically investigates the relationship between FDI and CDS premiums in Türkiye and analyses whether there is a relationship between the monthly frequency data between 2011-2023. In order to determine the relationship between the variables, the stationarity of the variables was first determined. "Lee and Strazicich (2003)" unit root tests, which take into account structural breaks, were applied to the data. Whether there is causality between the variables, and if there is a causality relationship, the determination of the direction of causality is mutually tested with the "Granger Causality" method. As a result of the study, no causality relationship was found from FDI to CDS premiums and from CDS premiums to FDI at 5% significance level. In this case, H_0 hypothesis cannot be rejected. In order to confirm the Granger causality test, the variables were subjected to time-varying causality test and again no causality relationship was detected throughout the periods analysed. When the results of the study are compared with other studies in the literature, it is similar to the results of Öztürk et al. (2018), while it differs from the results of Fei, Fuertes and Kalotychou (2017), Koy and Karaca (2018), Kahıloğulları (2018), Yıldırım and Sakızcı (2019), Sevil and Ünkaracalar (2020), İlter and Gök (2021), Şenol et al. (2023). It is thought that the difference between the results of other studies in the literature and the principle is due to the date range used and different analysis methods. In future studies, more comprehensive results can be obtained with panel data sets to be formed from more country data.

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