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Relationship between Political and Financial Risks in Turkey: Evidence from Fourier Cointegration Analysis Regarding Institutional Structures

Yıldırım Beyazıt ÇİÇEN *(https://orcid.org/0000-0002-3425-280X), Department of Economics, Gümüşhane University, Turkey; e-mail: ybcicen@gumushane.edu.tr*

Türkiye'de Politik ve Finansal Riskler Arasındaki İlişki: Kurumsal Yapılara Dair Fourier Eşbütünleşme Analizinden Kanıt

Abstract

Institutional structure and quality of management are the main elements that form the political risks. Political threats are directly linked to the institutional structure and the institutional design. Political risks increase if the government mechanisms fail. Increasing institutional quality reduces the political risks and positively impacts the financial risks. Monthly data from different indices are used to analyse the relationship between Turkey's political risks and financial risks between 2002 and 2015. According to the Fourier analysis of cointegration, there is a long-term relationship between the political and financial risks. Besides, as per the Fully Modified Ordinary Least Squares (FMOLS) findings and the Dynamic Ordinary Least Squares (DOLS) models, an increase in the political risk increases the financial risk.

Keywords : Fourier Stationarity, Fourier Cointegration, Turkey, Institutional Structure, Political Risk, Financial Risk.

JEL Classification Codes : C32, P48, G32.

Öz

Kurumsal yapı ve yönetim kalitesi politik riskleri oluşturan ana unsurlardır. Politik riskler doğrudan kurumsal yapı ve kurumsal tasarıma bağlıdır. Hükümet mekanizmaları başarısız olduğu takdirde siyasi riskler artmaktadır. Kurumsal kalitenin arttırılması politik riskleri azaltır ve ayrıca finansal riskler üzerinde olumlu bir etkisi bulunmaktadır. Bu analizde Türkiye'de politik riskler ile finansal riskler arasındaki ilişki 2002-2015 yılları dönemine ait aylık veriler kullanılarak analiz edilmiştir. Fourier'in eşbütünleşme analizine bulgularına göre, politik ve finansal riskler arasında uzun dönemli bir ilişki bulunmaktadır. Ayrıca FMOLS ve DOLS modellerinden elde edilen bulguya göre politik riskteki artış finansal riskleri artırmaktadır.

Anahtar Sözcükler : Fourier Durağanlık, Fourier Eşbütünleşme, Türkiye, Kurumsal Yapı, Politik Risk, Finansal Risk.

1. Introduction

Several studies in the economic literature show a closeness between institutional structures and economic performance (North, 1990; Acemoglu & Robinson, 2008). Political institutions are a key factor in establishing institutional structures. By implementing contracts and protecting property rights, political institutions ensure the real economy and financial sectors function more efficiently (Menard & Shirley, 2008). Political risk is expressed as the risk of unexpected changes in the rules under which businesses operate by the political authority after the start of the game under which (Butler & Joaquin, 1998: 599). Such changes may increase uncertainties in markets and affect investments. Companies do not make long-term investments unless the institutional structures commit to structural integrity and a reasonable rate of return on their capital asset investments (North, 1993; Levy & Spiller, 1994).

There is a broad correlation between low institutional quality and political instability (Aron, 2000: 104-118). As each country has its own institutional structures, the effects of political institutions should be examined with respect to individual countries. The poor institutional structure design is particularly important in the case of developing countries (Estache & Wren-Lewis, 2009) because political risks affect the developing countries more than the developed countries (Diamonte et al., 1996: 71).

A growing range of studies has been examining the role of legal institutions in disclosing financial institutions. The institutional structures created by a country's historical accumulation form its approach to protecting private property rights, regulating and enforcing private contracts, and protecting the investors' rights. This, in turn, affects the investors' abilities to vest in businesses, the quality of corporate governance, and the development in financial markets. Financial development also leads to long-term growth (Beck & Levine, 2005).

Neoclassical economic modelling considers institutions and institutional structures stable, but the institutional structure is internal and continually evolving in the real world. New financial products, advanced computer, and telecommunications technologies, and developments in the financial theory are some of the key reasons for institutional changes (Merton, 1995). When positive transaction cost rates or behavioural habits produce significant deviations from neoclassical equilibrium, new institutions begin to evolve, partially offsetting any inefficiencies. Therefore, the asset price forecasts, and the resource distributions of the neoclassical model become invalid in the long run as new institutional structures emerge (Merton & Bodie, 2005).

In Turkey, like in most developing countries, the financial markets have not been able to isolate themselves from the political influences. Therefore, considering the political risk is important to analyse the development of financial markets correctly and take appropriate measures as necessary (Tuncay, 2014: 67).

This paper begins with a literature review and then explains the data and the econometric methodology used in the current study. Finally, it discusses the empirical results of the analysis.

2. Literature Review

Several existing studies show the relationship between institutional and financial risks. These studies consider political risks as representing the institutional structures. In terms of representing the financial risks, stock market index prices, bond yields, exchange rate fluctuations, capital outflows, and company values are considered. The findings suggest that rising political risks reduce the stock returns and increase the uncertainty in the financial markets.

In many existing studies, the analyses are carried out on country-specific risks, considering the economic and financial risks as well as the political risks. However, in the current research, the studies examining the effects of political risks on financial risks only are included. Studies are reviewed in chronological order, listing the studies from Turkey first:

Yaprakli and Gungor (2007) analysed the effects of economic, political, and financial risks on stock prices using monthly data from the period 1986-2006. The risk premium numbers were obtained from the International Country Risk Guide (ICRG) and the stock prices from Borsa Istanbul (BIST). Johansen-Juselius cointegration test, Granger causality test, and regression methods were used for the analyses. According to the first finding of the study, there was a long-term relationship between political risks and stock prices. As per the causality test results, the political risks affected the stock prices; as per the last regression analysis, a 1% increase in the political risk premium reduced the BIST composite index value by 0.25%.

Mutan and Topcu (2009) conducted a selected event analysis between 1990 and 2009 to examine the effects of ten unpredictable economic and political events on the Turkish financial markets. The BIST 100 index and the case study methodology followed by Brown and Warner (1985) and then by Chen and Siems (2004) were used in the study. The findings indicated that unpredictable political activities substantially and negatively impacted the BIST 100 index.

In the study by Ayaydin and Karaaslan (2014), the relationships among the country risk components (political, economic, financial, and country risks) that were effective in determining the stock prices and the financial ratios were analysed using the dynamic panel data method. For this purpose, a monthly dataset belonging to 12 banks traded on BIST between 2003 and 2012 was used. According to the findings, the increase in the political risk premium had a decreasing effect on the stock prices in the banking sector.

Cam (2014) examined the effect of political risks on the values of companies registered in the BIST. The research data covered the years 2000-2009 on a quarterly basis; the risk data were obtained from the ICRG, and the data of 43 firms were obtained from the

BIST. Panel data analysis was used as the method. A statistically significant and negative relationship was found between the political risk premiums and the firm values. In other words, the increase in political risk decreased the values of the firms.

Kaya et al. (2014) analysed the relationship between political risk ratings and stock prices. Monthly data obtained from the ICRG and the BIST for the period 1998-2012 were used in the analysis. Johansen Juselius cointegration test, Granger causality test, and regression analysis were used as the methodologies. According to the findings, there was a causality from political risk to the stock prices; there was a long-term and negative cointegration relationship between the political risk ratings and the BIST 100 stock prices.

Tuncay (2014) analysed the relationship between the stock returns of 47 firms traded on the BIST and the political risks for the period 1997-2013, with monthly data within the framework of the financial asset pricing model. It was determined that four political risk variables out of 12 political risk components of the ICRG had a significant effect on the expected returns. These variables were internal conflicts, external conflicts, government stability, and the role of the military in politics. The increase in political risks occurred from the government stability increased the expected returns, while the other risk components decreased the expected returns.

Kara and Karabiyik (2015) investigated the impact of country risk premiums on stock prices. In the study, the relationship between the risk variables (economic, financial, political, and country risks) and the BIST 100 index was analysed for the period 1990-2013, with monthly data. The methodologies used in the analysis were the Johansen cointegration test and the vector error correction model. According to the findings, the political risks affected the stock prices in short- and the long-run negatively.

Ayaydin et al. (2016) examined the effect of Turkey's country risks on the stock prices. The economic, political, financial, and country risks were used as the variables in the study. The risk data were obtained from the ICRG and the stock prices from the BIST 100 index. Time series analysis was made with monthly data for the period 2002-2015. The Johansen cointegration test, error correction model, and the Granger causality test were used in the analysis. The findings pointed to a negative relationship between the stock returns and the political risk. Accordingly, a one-unit increase in the political risk caused a 1.62-unit decrease in the stock returns. In addition, a one-way causality from political risk to stock returns was found.

Tukenmez and Kutay (2016) analysed the impact of risk groups (political, economic, and financial) on the stock prices for Turkey and Argentina using monthly ICRG data for the period 1996-2013. As per the results, there existed a long-term relationship between the degree of political risk and the stock prices in Turkey. The increase in political risks negatively affected the stock prices. However, the analysis for Argentina found no relationships between the degree of political risk and the stock prices.

Toraman and Tuncay (2017) investigated the effects of political risks on the returns of securities traded in Turkey's capital markets. The study examined the relationship

between monthly asset returns of 47 companies traded on the BIST and the political risks in Turkey from 1997 to 2013. The results of the two-stage regression method analysis showed a positive and linear relationship between the political risks (data obtained from the ICRG) and the expected returns. Four of the 12 political risk factors, namely, internal conflict, external conflict, stability of the government, and the role of the military in politics were found to have a statistically significant effect on the expected returns. Of these risk factors, only the stability of the government was found to positively affect the asset returns.

Tuncay (2017) investigated the long-term relationship between financial markets and political risk in Turkey by applying cointegration tests and causality tests to the data obtained from the BIST and the ICRG. In the analysis, dollar-based monthly returns from the BIST 100 Index and the total political risk ratings, including the four political risk subcomponents, were used. Empirical findings showed that the four political risk factors (internal conflict, external conflict, role of military in politics, and stability of the government) and the total political risk rating were cointegrated with the returns of BIST 100.

Oral and Yilmaz (2017) investigated the effect of political risks in the systematic risk group and financial risks in the non-systematic risk group on the BIST Industrial Index, which included the stocks of industrial companies. In the analysis, the Autoregressive Distributed Lag Bound Test (ARDL) method was used on the data from 1992 to 2004. According to the findings, increased political risks obtained from the ICRG had an impact on the BIST Industrial Index in the short and long terms.

Hatir (2019) analysed the relationship between political risks and stock returns of firms in different sectors traded on the BIST, on the monthly data for the period 2006-2016, using the panel data method. The daily closing data of the stocks were taken from the BIST, and their monthly average values were calculated; the data used for evaluating the political risks were obtained from the ICRG. It was found that the increase in political risks had a negative impact on all the sectors examined at different levels. In addition, according to the results of the panel causality test, while the political risk changes affected the stock returns, the changes in the stock returns did not have an impact on the political risks.

Even when considering country-related studies, similar findings are found. The scope of political risk includes factors such as political stability, level of democratization, election and regime changes, accountability, corruption, socioeconomic conditions, quality of bureaucracy, external conflicts, political news, and law and order. These components are closely linked to the design and management quality of the institutional structure (Epstein & O'halloran, 1999; Khan, 2004; Estache & Martimort, 1999). Increasing political risks in different countries have a negative impact on the indicators, returns, and vulnerabilities in the financial markets (Tuncay, 2017). Political risks are also an important determinant of investment decisions (Busse & Hefeker, 2007). On the other hand, it is concluded that political risks in developing countries make financial markets more critical than in the developed ones (Henderson & Rodriguez, 2008). Also, the financial risks of the countries are more sensitive than the economic and political risks (Diamonte et al., 1996; Fitzsimons

& Sun, 2012; Hammoudeh et al., 2013). Empirical studies from countries other than Turkey and multi-country analyses are described below chronologically:

Diamonte et al. (1996) investigated the effects of political risk in developed and developing countries. Monthly data for the period 1985-1995 were used in the study. According to the findings, political risk was a more important determinant of the stock returns in the emerging markets than in the developed markets. Average returns in the emerging markets, where political risks had decreased, were about 11% higher in a quarter than those in the emerging markets where political risks had increased. This difference was 2.5% for the developed countries. In addition, the study stated that the political risks in the developing countries tended to decrease in recent years, while they tended to increase in the developed countries.

Erb et al. (1996) analysed the relationship between the five risk components (political, financial, economic, and compound risks, and the country credit ratings) and the expected stock returns with cross-sectional and time-series analyses in their study of 117 countries with monthly data between 1984 and 1995. The risk data were obtained from the ICRG and Institutional Investors. Accordingly, there was a negative relationship between the political risks and the stock returns, especially in developing countries.

Chan and Wei (1996) examined the impact of political risks on Hong Kong stock volatility. The Hang Seng Index and the Red-Chip Index were used in the study. As per the initial findings, the developments in the political risk increased the volatility of both the indices. In addition, the positive or negative developments regarding the political risks affected the Hang Seng index returns positively or negatively, as the case may be, while the positive or negative developments in the political risks did not affect the returns of the Red-Chip shares.

Lensink et al. (2000) analysed the relationship between political risks and capital outflows in 84 developing countries for the period 1971-1991. World Bank for capital outflows, Polity III code book for political risk, and World Bank Economic Indicators databases for different macroeconomic variables were used as the data sources. The cross-section regression method was used for the analysis. When local and international macroeconomic conditions were added to the findings from the study, the political risk variables had a statistically robust relationship with the capital outflows. Consequently, increasing political risks accelerated the capital outflows.

Perotti and Oijen (2001) investigated the impact of privatization on stock market development and returns through the changes in political risks in their study of emerging economies. The study examined 22 developing countries and covered the period 1988-1995. Political risks were obtained from the Country Credit Rating (CCR) and ICRG databases, and other data were obtained from the International Monetary Fund (IMF) and the World Bank Global Development Finance institutions. According to the findings obtained from the regressions, progress in privatization was associated with improvements in perceived

political risk. The study concluded that a general reduction in political risks was an important factor for the development of local stock markets in developing countries.

Kim and Mei (2001) analysed the relationship between political developments and stock markets for the period 1989-1993, on daily data using the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model. The Hong Hang Seng index was used for financial data. The political news indices were derived from the abstracts of the Wall Street Journal and the New York Times; the study constructed three indices regarding the political issues. The findings indicated that unexpected return jumps in the markets were closely associated with political news and that the impact of the news was asymmetric, with bad news having a greater volatility effect than good news.

Le and Zak (2006) examined the relationship between capital outflows and three types of risks in 45 developing countries for the period 1976-1991. The types of risks used were economic risks, political instability, and policy variability. As per the analysis made with the panel data method, all three risk types were statistically significant. Quantitatively, political instability was the most important factor for capital outflows. In addition, the capital outflows could be reduced with various constitutional amendments and reforms.

Lehkonen and Heimonen (2015) analysed 49 developing countries in the period 2000-2012. The impact of democracy and political risks on stock returns was examined using panel data analysis on annual data. The political risk variables were obtained from Polity IV and the ICRG. For stock data, the MSCI Standard Total Return Index was used. It was found that political risks affected the stock returns, and a decrease in political risks increased the stock returns. The importance of using some different measures of democracy was emphasized for the validity of the findings obtained in the study.

Dimic et al. (2015) used panel data analysis during the period 1990-2013 to investigate how political risk factors affected the stock returns in 64 countries by the individual country's degree of development (developed, emerging, and frontier markets). The political data in the study were obtained from the ICRG, and the other data were obtained from the MSCI Standard Total Return Index. As per the results, an increase in political risk negatively affected the stock returns in all the countries. The common source of political risks that negatively affected the stock returns in all three market categories was the government action index. This index included the stability of the government, socioeconomic conditions, and investment profiles.

Huang et al. (2015) investigated the impact of 109 international political crises that occurred between 1998 and 2007 on government bonds in 34 debtor countries. The international political crises were used as proxies for the political risk variables. According to the analysis made considering the country-specific economic conditions, a positive and significant relationship was found between international political risks and the yields of the government bonds. This was consistent with global bond investors demanding higher returns in times of high political uncertainties. Moreover, it was found that the negative impact of

international political risks on bond prices diminished when the borrower country had a stable political system and strong investor protection laws.

Duyvesteyn et al. (2016) analysed the relationship between political risks and government bond prices with panel data analysis using monthly data from 35 countries in the period 1993-2014. The political risk data was obtained from the ICRG, while the returns data from J.P. Morgan's European Monetary Union Bond Index and the Emerging Market Bond Index. According to the results, the government bond prices were slowly adapting to the changes in the political risks, and the expected bond yields were higher in countries with improved political risk ratings than in countries with worsening political risk ratings. The conclusion drawn from the findings was that the change in political risk was a new driver of future differences in global government bond risk premiums.

Though there are several existing studies on the effects of political risks on the financial markets, no studies are found that holistically address the effects of political risks on the financial risks specific to Turkey. The new Fourier technique applied in the current analysis reveals the existence of a long-term relationship, which shows the structural characteristics of the Turkish markets.

3. Data and Methodology

This section outlines the data and the econometrical methodology. The Fourier ADF (FADF) unit root test and the Fourier Engle-Granger (FEG) cointegration test were used as the study methods.

3.1. Data

The current research used monthly data between January 2002 and December 2015. The model used the Political Risk Rating index (PRR), which measures institutional structure quality, and the Financial Risk Rating index (FRR), which measures the financial market risks. Data were purchased from the PRS Group's ICRG database. The ICRG database provides regular and extensive data on the measurement of political, economic, and financial risks of countries and is frequently referred to in the literature due to its reliability.

The PRR is over 100 points, while the FRR is over 50 points. Rising scores indicate that the risk in the field has decreased, and low scores indicate that the risk has increased.

PRR is an index to measure the political stability of the countries. The risk components of PRR are[1]:

- Stability of the Government - 12 points
- Socioeconomic Conditions - 12 points
- Investment Profile - 12 points

[1] *The methodology details of the ICRG data can be accessed from the link: <https://www.prsgroup.com/wp-content/uploads/2012/11/icrgmethodology.pdf>, 04.07.2020.*

- Internal Conflict - 12 points
- External Conflict - 12 points
- Corruption - 6 points
- Role of Military in Politics - 6 points
- Religious Tensions - 6 points
- Law and Order - 6 points
- Ethnic Tensions - 6 points
- Democratic Accountability - 6 points
- Quality of the Bureaucracy - 4 points

When evaluating the PRR components, factors such as the stability of the government, investment profile, conflicts, corruption, role of the military in politics, accountability, and the quality of the bureaucracy are closely examined with respect to institutional structure design and management quality. The PRR score of the country is of very high risk if less than 50; of high risk, if between 50 and 60; of moderate risk, if between 60 and 70; of low risk, if between 70 and 80; and of very low risk, if between 80 and 100.

FRR evaluates the risks of the country's ability to pay. This index measures the country's ability to finance its official, corporate, and commercial debt liabilities. The components of FRR include:

- Current Account as a Percentage of Exports of Goods and Services - 15 points
- Foreign Debt as a Percentage of GDP - 10 points
- Foreign Debt Service as a Percentage of Exports of Goods and Services - 10 points
- Net International Liquidity as Months of Import Cover - 5 points
- Exchange Rate Stability - 10 points

The FRR score of the country is of very high risk if the score is between 0 and 24.5; of high risk, if between 25 and 29.9; of medium-level risk, if between 30 and 34.9; of low risk, if between 35 and 39.9; and of very low risk, if over 40.

3.2. Fourier ADF Unit Root Test

The Dickey-Fuller unit root test can be written as:

$$y_t = \alpha(t) + \rho y_{t-1} + \gamma t + \varepsilon_t \quad (1)$$

In Equation 1, $\alpha(t)$ is a deterministic function of *t*, and ε_t is the error term. Here, the unit root existence ($\rho = 1$) is tested. If the form of the deterministic term is unknown, the test yields biased results. Enders and Lee (2012) suggested the following as the deterministic term for such situations:

$$\alpha(t) = \alpha_0 + \sum_{k=1}^{n} \alpha_k \sin\left(\frac{2\pi kt}{T}\right) + \sum_{k=1}^{n} \beta_k \cos\left(\frac{2\pi kt}{T}\right);\ n \leq T/2 \quad (2)$$

In Equation 2, *n* is the number of frequencies, *k* is the determined frequency, and *T* refers to the number of observations. However, if the trigonometric terms in Equation 2 are not meaningful, conventional unit root tests would be more appropriate. For this purpose, the calculated F-constraint test value and the F table value are compared. Our null hypothesis here was the "trigonometric terms are not significant."

So, substituting Equation 2 in Equation 1:

$$\triangle y_t = \rho y_{t-1} + c_1 + c_2 t + c_3 \sin\left(\frac{2\pi kt}{T}\right) + c_4 \cos\left(\frac{2\pi kt}{T}\right) + e_t \quad (3)$$

Enders and Lee (2012) proposed two steps for estimating the Equation 3 model. In the first step, all models are estimated for $1 \leq k \leq 5$, and the model with the smallest residual squares is selected as the appropriate model. In the second step, the FADF test statistics are compared with critical values, and the unit root decision is made.

In some cases, the deterministic time series is not added to Equation 3. These models prevent the existence of linear trends. Fourier functional tests with level shifts are suggested when a linear trend is absent[2] (Enders & Lee, 2012: 199). The critical values of these tests are calculated separately. It should be noted that the critical values depend only on the frequency value *k* and the number of observations *T* in the Fourier approach.

FADF has many advantages over conventional unit root tests. For example, the ADF test is unsuccessful in capturing shocks like policy changes and disasters, so stationary results may be erroneous. Some conventional tests have tried predicting structural breaks with a dummy variable. For instance, Perron (1989) tried to develop a test by adding dummy variables to the ADF test, but weaknesses occurred as the break date was externally determined. Break date misidentification differentiates the estimates of the model. Also, the power of the test decreases as the dummy reduces the degree of freedom. Among other important tests, the Zivot and Andrews test (ZA) (Ziyot & Andrews, 1992) sets its break date. This test is criticized for addressing only sudden structural changes, as change is slower in the real world. Also, if there is more than one structural break in the period concerned, the model results obtained from ZA will be incorrect. Similarly, the number of breaks is determined internally or externally (Kwiatkowski et al.,1992; Lee & Strazicicih, 2003). However, all these tests require sharp breaks to capture the changes. On the other hand, some tests are developed to capture smooth break transitions (Harvey & Mills, 2004). These studies also assume a predetermined number of sharp fractures or a specific nonlinearity. Errors in breakage number or specification will disturb the results.

The Fourier functions capture such nonlinear changes using sine and cosine values. Before setting the model, there is no need to find the number of breaks. The number of breaks is the number of frequencies (*k*) determined as peaks by the model. Besides, since the

[2] *As seen in Figure 1, there was no linear trend in our series. For this reason, we used the model with only a constant (without a trend) in all the unit root and cointegration analyses.*

breaks found in the Fourier function do not reduce the degree of freedom, the test strength is higher (Becker et al., 2006).

3.3. Fourier Engle-Granger Cointegration Test

Cointegration analysis tests the long-term relationship between the economic variables. However, the conventional cointegration tests are affected by structural changes like crises and shocks, policy changes, and technological progress. While some cointegration tests like that proposed by Engle and Granger (1987), which do not take structural change into account, lead to inaccurate analyses, some others allow structural changes to be analysed using dummy variables. Becker et al. (2006) started modelling the structural breaks using Fourier. Due to the trigonometric terms used in the model, the location, number, and form of structural breaks need not be determined in advance.

Consider the following regression for the FEG cointegration model:

$$y_{1t} = d(t) + \beta' y_{2t} + u_t;\ t = 1,2,\dots,T \tag{4}$$

where $d(t)$ is a deterministic function of *t*, which can be estimated using a single-frequency component of Fourier expansion. This function is shown below:

$$d(t) = \alpha_0 + \gamma_k \sin\left(\frac{2\pi kt}{T}\right) + \delta_k \cos\left(\frac{2\pi kt}{T}\right) \tag{5}$$

The α_0 in Equation 5 is the conventional deterministic term with a constant (and a linear trend). T denotes the number of observations, and k is the Fourier frequency. The frequency value minimizing ordinary least squares (OLS) is considered. When $\gamma_0 = \delta_k = 0$, there is no nonlinear trend, and in this case, a conventional cointegration test is used.

So, when Equation 5 is transferred to Equation 4:

$$y_{1t} = \alpha_0 + \gamma_1 \sin\left(\frac{2\pi kt}{T}\right) + \gamma_2 \cos\left(\frac{2\pi kt}{T}\right) + \beta' y_{2t} + u_t \tag{6}$$

To test the null hypothesis that there was no cointegration, the ADF unit root test was applied to Equation 6 residuals, and the regression in Equation 7 was tested.

$$\triangle \hat{u}_t = \rho \hat{u}_{t-1} + \sum_{i=1}^{p} \gamma_i \hat{u}_{t-i} + \varepsilon_t \tag{7}$$

In Equation 7, $\varepsilon_t \sim i.i.d.(0, \sigma^2)$ and τ_{FEG} test shows the t-statistics for the null hypothesis of cointegration.

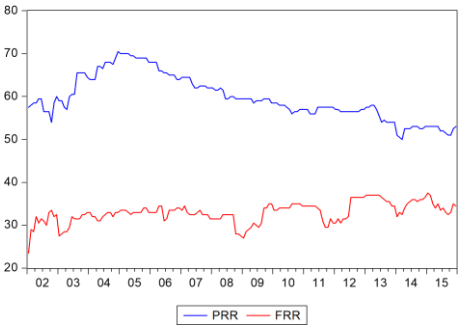
$$\tau_{FEG} = \frac{\hat{\rho}}{st.error\ (\hat{\rho})} \tag{8}$$

In Equation 8, $\hat{\rho}$ is the least square estimator of ρ.

4. Empirical Findings

Figure 1 shows PRR and FRR for Turkey. When the course of the political risk variables is examined in Turkey, there is improvement until 2006, but the political risks tend to increase overall after that year. Following the global crisis, risks follow a horizontal course. On the other hand, financial risks show fluctuations in various periods but generally show flat trends.

Figure: 1
PRR and FRR for Turkey



Since the PRR and FRR series were released in a narrow range, our analogy did not use natural logarithms. The unit root tests were applied to the series' first, and then the cointegration analysis was done.

Table 1 shows the FADF unit root test results for the PRR and the FRR series.

Table: 1
Fourier ADF Unit Root Test Results

Series	Frequency	Min. OLS	F test	FADF
PRR	1	140,27	0,43	-1,31
FRR	5	199,76	14,43	-3,37
ΔFRR	5	203,09	0,14	-7,64
Note: The critical values for the F test used to determine the significance of trigonometric terms are 10,35, 7,58, and 6,35, respectively, at 1%, 5%, and 10%. FADF test critical values for 1%, 5% and 10% (k = 5): -3,58, -2.93, -2.60. In the FADF test, the selected maximum lag length is 4. The appropriate lag length for all three variables in the table is 4.				

Before evaluating the unit root test results, the significance of the trigonometric terms was checked. For this purpose, the F-constraint test results were compared with the critical F value. According to the findings for PRR in Table 1 (since 0.43 < 6.35), the null hypothesis cannot be rejected, and the trigonometric terms are not significant. As FADF should not be used for unit root testing, conventional unit root tests were applied; the results are given in Table 2.

According to the results of the F test statistics of FRR (since 14.43 > 6.35), the trigonometric terms were meaningful, and FADF should be used in the unit root test. The null hypothesis was rejected according to the 5% significance value of the FADF test

statistics (because its absolute value 3.37 > 2.93). FRR had a unit root. Under the F-constraint test, the ΔFRR variable could not be tested with FADF. For this reason, conventional unit root tests were used for unit root testing. The ADF and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test results of the variables are given in Table 2.

Table: 2
Conventional Unit Root Test Results

Series	Method	Test Statistics
PRR	ADF	-0,84
PRR	KPSS	1,06
ΔPRR	ADF	-12,66
ΔPRR	KPSS	0,28
ΔFRR	ADF	-11,09
ΔFRR	KPSS	0,27
Note: The critical values of 1%, 5% and 10% for the ADF test are -3,47, -2,87, and -2,57, respectively. The critical values for KPSS test are 0,74, 0,46 and 0,35 for 1%, 5% and 10%, respectively. In the ADF test, the selected maximum lag length is 13. The appropriate lag length for all three variables in the table is 0 with Schwarz Info Criterion. In the KPSS test, the bandwidth is automatic selected with Newey-West using Bartlett kernel. The PRR and ΔPRR bandwidth is ten and the ΔFRR bandwidth is 9.		

The null hypothesis of the ADF test was that the variable was unit-rooted, and the null hypothesis of the KPSS test was that the variable was stationary. According to ADF unit root test statistics, the null hypothesis could not be rejected, and the PRR was unit-rooted. The KPSS root test statistics findings rejected the null hypothesis, and the PRR was not stationary. The test results matched each other. Similar tests were performed on the first difference of the PRR variable, and the ΔPRR variable was stationary; so, the PRR variable was I(1).

The ΔFRR variable was stationary and therefore the FRR variable was I(1). Since both the PRR and the FRR variables were I(1), these variables could be tested for cointegration. Table 3 provides the results of the cointegration test to model the long-term relationship between Turkey's political and financial risks.

Table: 3
FEG Cointegration Results

Dependent Variable	Independent Variable	Frequency	Min. OLS	FEG Cointegration Test Statistic
FRR	PRR	4	504.82	-5.05
Note: FEG cointegration critical values for 1%, 5% and 10% (k=4): -4,28, -3,59 and -3,25.				

The result of FEG cointegration rejects the null hypothesis at 1% level. So, Turkey has a cointegration relationship between political risks and financial risks. Table 4 reports the estimating results from Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS) analyses. The model with a constant without a trend was used, and the Fourier trigonometric terms were added to the deterministic regressors in the model estimation for the two models. The findings from the FMOLS and the DOLS models indicate that a 10% increase in political risk increases the financial risk by 5.5%.

Table: 4
FMOLS/DOLS Results

Model	Dependent Variable	Independent Variable	Coefficient	Std. Error	t-stat.	p-value
FMOLS	FRR	PRR	0.545	0.037	14.727	0.000
DOLS	FRR	PRR	0.547	0.011	49.454	0.000
Note: The frequency value is taken as 4 as in the FEG estimation.						

These results indicate that stability in the functioning of the institutional structures and the positive steps taken on issues such as law, democracy, bureaucracy, and corruption reduce long-term financial risks for Turkey.

5. Conclusion

Financial investments have reached an international dimension with financial liberalization, especially after the 1980s. As a result, all the world countries, especially the developing countries, have achieved access to large amounts of financial investments. In this context, investors have started to take more interest in the economic, financial, and political conditions of the countries they plan to invest in. Overall, increased political risks are a major obstacle to financial investments.

In the current research, the long-term relationship between institutional structures and financial risks in Turkey was evaluated from January 2002 to December 2015 using monthly data. Fourier and conventional unit root tests examined the series stationarity. The political risk ratings used for the institutional structure and the financial risk rating variables were not stationary. The cointegration relationship between these two variables was investigated by the newly introduced Fourier Engle-Granger cointegration test. According to the findings, Turkey showcases a long-term relationship between political risks and financial risks. These findings obtained from the current study are useful to the decision-makers, such as policymakers, companies, and investors. While globalized financial markets cannot deepen due to the failure of institutional structures to gain stability, companies both avoid investment in an environment of uncertainty and facing the risk of losses due to rising costs. This indirectly affects the economic welfare of the entire society.

When the existing literature was examined, political risks, in general, were found to affect the financial risk components negatively. The results obtained from the current study also point in this direction. But it should be noted that the current study examined the aggregate of financial risks and not the components of financial risks like stock prices and firm values. Especially for developing countries, accumulating capital and attracting more financial investments to the country are important. Reducing the political risks emerges as an important prerequisite to this.

To sum up, reducing the financial risks of Tukey requires reducing the political risks. Reducing political risks depends on enhancing institutional quality, so the institutional structure can work efficiently. In order to increase this efficiency, adherence to the rule of law, protection of property rights and contracts, ensuring the stability of the government, securing of freedoms, reducing the perception of corruption, diluting the role of the military in politics, reducing tensions, and enhancing the quality and transparency of bureaucracy are

important. In future studies, the extent to which these institutional variables affect the financial risks may be investigated in more detail. In addition, a more comprehensive analysis or comparison of the different countries, the use of datasets from different periods, including financial crises, and the use of different econometric methods may remove the limitations of this study and provide more detailed and fresher perspectives.

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