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# Relationship between Institutional Quality and Corruption: The Case of Turkey

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| **Kurum Kalitesi ve Yolsuzluk İlişkisi: Türkiye Örneği** | **Relationship between Institutional Quality and Corruption: The Case of Turkey** |
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| **Öz** | **Abstract** |
| Bu çalışmada Türkiye'de yolsuzluk düzeyi ve kurumsal yapının kalitesi ilişkisi ele alınmıştır. Kurumsal yapının kalitesi yolsuzluk açısından önemlidir. Türkiye'de bu ilişkinin olup olmadığının ortaya koyulması amacıyla 1984-2015 yılları arası çeyreklik verilerden faydalanılarak RALS-ADF birim kök testi ve RALS-EG eşbütünleşme testi uygulanmıştır. Kullanılan değişkenler; bağımlı değişken olarak yolsuzluk düzeyi, bağımsız değişken olarak kurumsal kaliteyi temsilen politik risk derecesi ve kontrol değişkeni olarak toplam üretim endeksidir. Öncelikle koalisyon ve tek parti dönemi birlikte analiz edilmiştir. İkinci olarak sadece koalisyon dönemini içeren 1984-2002 dönemine ilişkin analiz gerçekleştirilmiştir. Her iki analizde de Türkiye'de yolsuzluk düzeyi ve kurumsal yapının kalitesi arasında bir eşbütünleşme ilişkisi bulunmamıştır. | The relationship between the level of corruption and the quality of Turkey's institutional structure was investigated in this study. Using quarterly data between 1984-2015, RALS-ADF unit root and RALS-EG cointegration tests were used to determine if there is a relationship between these variables in Turkey. Corruption level is the dependent variable, institutional quality is the independent variable, and the total production index is the control variable. The first analysis included both the coalition and single-party periods. Also, a separate analysis was carried out for the coalition period 1984-2002. There was no correlation between corruption and institutional quality in either analysis. |
| **Anahtar Kelimeler:** Kurumsal kalite, Yolsuzluk, Türkiye, RALS | **Keywords:** Institutional Quality, Corruption, Turkiye, RALS |
| **JEL Kodları:** D02, D73, C32 | **JEL Codes:** D02, D73, C32 |

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| **Araştırma ve Yayın Etiği Beyanı** | Bu çalışma bilimsel araştırma ve yayın etiği kurallarına uygun olarak hazırlanmıştır. |
| **Yazarların Makaleye Olan Katkıları** | Çalışma tamamı yazar tarafından hazırlanmıştır. |
| **Çıkar Beyanı** | Yazarlar açısından ya da üçüncü taraflar açısından çalışmadan kaynaklı çıkar çatışması bulunmamaktadır. |

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## 1. Introduction

Corruption is the misuse of public power for personal gain. According to Transparency International, corruption is defined as the abuse of entrusted power for personal gain. According to this definition, corruption can occur in a variety of ways. The first is that public officials are paid in exchange for their work, service, or other interests. The second is that politicians misappropriate public works and contracts and give them to close groups. Third, businesses bribe officials in order to secure lucrative deals. Corruption is closely related to a country's institutional structure and is a governance failure. In a country with no inclusive institutions, there are many negative economic consequences because the institutional structure is not transparent and accountable, the rent-seeking activities develop, the quality of bureaucracy is low, and the service is based on particular interest groups instead of the general public. Corruption has negative consequences for investment (especially foreign direct investment). Due to this situation, economic growth slows down (Mauro, 1995: 683). In the case of corruption, the second significant adverse effect is the deterioration of the market's allocation efficiency. The main causes are a decrease in human capital accumulation (talent) and a misallocation of physical capital. The emergence of rent-seeking in countries moves talents away from entrepreneurship. In such an environment, companies lose their innovation desire. These factors hinder growth (Murphy et al., 1991: 2-4; Bardhan, 1997: 1322). However, some studies show that corruption does not affect or increase growth in countries with exclusionary institutions or low governance quality (Méon and Sekkat, 2005; Méon and Weill, 2010). On the other hand, in democracies with inclusive institutions, national anti-corruption strategies can be developed and implemented by strengthening institutions and ensuring the rule of law. With the reduction of corruption, higher growth rates, lower poverty rates, more investment, and higher public policy efficiency can be achieved (Hope Sr., 2017: 1-2).

The relationship between corruption and economic growth has been studied from two different perspectives. A first view holds that corruption promotes economic growth, known as the grease the wheels hypothesis. According to this viewpoint, corruption reduces regulations' effects on the private sector, facilitating commercial transactions and stimulating economic growth. In turn, this increases efficiency. As a second view, the sand and wheel hypothesis suggests corruption slows economic growth. Firm sizes and investments shrink as a result of corruption, according to this hypothesis. Additionally, corruption reduces transparency, hinders political performance, wastes taxpayer funds, and worsens income distribution. Economic growth is slowed due to these and other factors (Campos et al., 2015: 1-2).

In order to prevent corruption, it is necessary to strengthen the judiciary, develop anti-corruption regulatory regimes, and implement appropriate institutional reforms. The presence of strong checks and balances in the context of a competitive market system will reduce the incentives for rent-seeking and corruption in these circumstances (Broadman and Recanati, 2001: 361; Uberti, 2016: 317). It is necessary that the democratic institutions to be established are effective, that long-term corruption networks are hard to maintain, and that a structure with various levels of accountability and transparency be constructed (Bardhan, 1997: 1330). Anti-corruption legislation, however, must be evaluated within the historical, cultural, institutional, and ultimately existential context of its enactment. Therefore, a

country's institutional structure, which includes formal and informal institutions, can aid in understanding corruption (LaPalombara, 1994: 334).

In this study, the relationship between the level of corruption and the quality of the institutional structure in Turkey is investigated. Thus, it is aimed at providing insights on how Turkey's existing institutional structure affects corruption. Following the introduction, the literature on corruption is reviewed. The third chapter describes the econometrics methodology used in the analysis. The RALS procedure, developed recently and intended for non-normally distributed series, was applied to the analysis. Other subheadings in this section include the RALS-ADF unit root test, the RALS-EG cointegration test, and the data and analysis section. As a first step, this section discusses the data used in the study, followed by the analysis and results. Finally, a conclusion is provided based on these results.

**2. Literature Review**

Several studies examined the relationship between institutions and corruption from a variety of perspectives, including institutional structure, institutional quality, institutional factors, governance, and the impact of institutions on economic growth, development, and economic performance. The literature section lists important studies in this field chronologically based on the institutional factors used.

A study conducted by Broadman and Recanati (2001) examined transition economies. The causes and origins of corruption are unknown, according to this study. Research indicates that low entry barriers and high budgetary constraints are important factors in preventing corruption. It is hard to pin down the intricate relationships between corruption's determinants. In this empirical study, corruption was used as a dependent variable, while government quality, political institution quality, and openness to foreign trade were used as independent variables. According to the study, policymakers should design and implement economic reforms that encourage the development of crucial market institutions to reduce corruption incentives in order to combat the corruption problem. Additionally, new research is suggested to better understand the impact of banking-financial sector reforms on corruption.

In their book, Abed and Gupta (2002) explain corruption's causes and consequences. There is also discussion of the relationship between corruption and a variety of economic issues. These include corruption and government spending, corruption and taxes, and corruption and income distribution. When examining these issues, institutions are taken into account. The research suggests that in weak and poorly managed economies, entrenched profiteering groups can control the state to maintain monopolies and gain rent, as well as stifle competition and economic reform. Additionally, corruption reduces the effectiveness of the government and undermines public trust in its policies.

New studies have recently been published on the causes and effects of corruption, despite studies focusing on the effects of political institutions on economic growth, social equality, and political stability. Yet, little is known about how various political institutional arrangements prevent corruption. Gerring and Thacker (2004) examine how regional sovereignty (unitary or federal) and executive power (parliamentary or presidential) play a role in the level of corruption. The first finding of the study is that unitary and parliamentary governments reduce corruption. It has also been found that centralized constitutions reduce political corruption.

Collier (2002) examines corruption from the perspective of institutions. According to this study, complex institutions such as corruption consist of an ever-changing mix of three different social rules that perform different functions. As a first step, instruction rules define the principles, beliefs, or norms that inform agents of the organization's goals. Secondly, directive rules provide specificity to the instructions' principles, beliefs, and norms. A directive rule tells agents what to do in support of an instruction rule. When an agent fails to comply with a directive, sanctions are necessary to make the guidelines effective. As a third factor, commitment rules define the roles of agents. These rules explain agents' rights or duties. The purpose of commitment rules is to provide well-defined powers for some agents while reassuring others that they will not be abused. Depending on their formality and power, the three rules fulfill their assigned functions. A rule's formality depends on how well it is supported by other rules. The strength of a rule depends on how often it is followed. It is now imperative that states implement anti-corruption programs in order to reduce corruption reliably.

Democratic governance arrangements should provide the best environment to control corruption and secure property rights. However, the dynamics of corruption in developing democracies are quite unclear. When comparing autocracies, transitional economies, and democracies, we can conclude that corruption is more prevalent in autocracies, moderate in transitional economies, and rare in established democracies. Accordingly, democratic governance and an independent judiciary provide the best opportunities to combat corruption. Weaker democracies need to improve their legal structure to increase their capacity to minimize corruption. Therefore, new research is needed to protect property rights and design mechanisms to facilitate the democratic transition in these countries (MacIntyre, 2003: 18-20). On the other hand, according to Fritzen (2005), most anti-corruption initiatives face an internal dilemma. According to this dilemma, while actors should adopt and implement policies to prevent corruption, they may not be willing to do so, especially in authoritarian regimes. Because when these actors engage in such a struggle, they are afraid of gradually losing their legitimacy.

Based on a cross-country panel, Lederman et al. (2005) investigated the determinants of corruption, paying particular attention to political institutions that increase accountability. Since political institutions play a significant role in determining corruption in the theoretical literature, empirical literature is relatively sparse. According to the findings, political institutions play an important role in determining corruption prevalence. Corrupt practices can be reduced by democracy, parliamentary systems, political stability, and freedom of the press. Aside from that, the common conclusions of previous empirical literature on openness and the legal tradition do not hold when political variables are taken into consideration. The study also found that a decentralized government structure reduces corruption.

In the article published in 2008, Aidt et al. explored how political accountability influences corruption and economic growth. This study identified two types of governance regimes based on the quality of political institutions, and concluded there is a specific relationship between corruption and growth within each regime. A regime with high-quality political institutions is less likely to suffer from corruption. When low-quality institutions are in place, corruption does not affect growth.

Emek and Acar (2008) discussed institutional options to combat corruption. For this problem, there are two options: Only one authorized institution or the institutional structure

in which several institutions are authorized. Based on the analysis made using data from 25 countries, including Turkey, it has been found that increasing the independence and accountability of existing institutions will help fight corruption. There's less corruption in countries with multiple institutional structures than in countries with one. Institutional design plays a big role in preventing corruption. Increasing the independence, transparency, and accountability of existing institutions will make a difference.

Dreher et al. (2009) discussed the relationship between institutional quality, corruption, and the informal economy. The study examined different empirical models between 78-135 countries. According to the findings, institutional quality increases corruption and the informal economy. Reduced corruption requires the government to be as effective as possible in terms of institutional quality.

The relationship between economic freedom and corruption in the context of institutional quality was examined by Heckelman and Powell (2010). The economic freedom index was divided into five sub-components: Government size, international trade freedom, credit, labour, and market regulations. As institutions improve, corruption's benefits diminish. The growth benefit of corruption is reduced significantly and eventually turns negative as economic freedom develops in government size and regulation domains. According to these findings, policies aimed at reducing corruption generally will not always lead to higher economic growth rates.

De Vaal and Ebben (2011) claim that the majority of empirical and theoretical literature on corruption and economic growth ignores the fact that corruption affects growth differently depending on the institutional environment. This causes the institutional structure to be viewed as a black box, which prevents the analysis of corruption's interactions with other institutions. Nevertheless, corruption can facilitate the functioning of formal and informal institutional systems, and its elimination can lead to economic decline. Using the model established in this study, it is shown that corruption reduces the productivity of both productive public goods and labour in an institutional vacuum, thereby suppressing growth. Institutional factors, however, complicate this relationship. The negative impact of corruption on institutions and reduced economic growth occurs when political stability or property rights protection is above a certain level. The relationship between corruption and growth is therefore largely determined by the initial institutional environment.

According to Oral (2011), both domestic and international corruption should be dealt with. Public support is also necessary to achieve success in dealing with corruption. Therefore, the level of corruption and quality of governance determine the priority in the fight against corruption. Shah and Schachter (2004: 42) report that governments in countries with high levels of corruption have poor governance. Therefore, it is imperative to ensure public dominance in the fight against corruption, strengthen institutional participation and accountability, limit state intervention, and implement economic reforms.

The role of corruption and institutional quality in market regulation was examined by Breen and Gillanders (2012). The results indicate that corruption negatively affects regulation quality. When corruption is controlled, institutional quality does not matter in terms of regulation. Based on the results, policymakers can reduce corruption by improving regulation rather than implementing broader institutional reforms. Empirical country analyses show that corruption determines regulation quality except in politically unstable environments.

Venard (2013) studied the impact of corruption on economic growth through institutional structures. Despite some studies claiming that corruption adversely affects economic performance, others mention a positive impact. A lack of consideration for the institutional structure quality is cited as the reason for the discrepancies. According to the study, corruption benefits economic development only when institutions are of low quality. As a consequence of the structural equation models applied in the study, institutions affect development both directly and indirectly through their effects on corruption.

Fjelde and Hegre (2014) examined jointly the relationship between formal political institutions and political corruption. Accordingly, political corruption is an informal institution that prolongs non-democratic regimes by generating political support from non-democratic leaders and liberalizing concessions in official institutions. In the empirical analysis, 133 countries and the period 1985-2008 were considered, and the dynamic regression model was used. According to the model, high-corruption autocracies and hybrid regimes are more stable than low-corruption ones, while low-corruption democracies are more stable than high-corruption ones. Furthermore, coherent democracies tend to be more stable as a result of reduced corruption.

Brol (2016) argues that corruption is a phenomenon that affects every society regardless of their geographical location or historical context. Despite different sizes and intensities of corruption, corruption exists in every country regardless of its economic system and legal system, according to the study. In spite of the current regulations, corruption has become widespread in some countries, replacing other forms of exchange. In countries with weak institutions, this determination is exceptionally accurate. These weaknesses can be caused by changes in political or cultural factors. This article highlights institutional factors that influence corruption. Despite minor institutional weaknesses, countries may be prone to corruption, according to the study. As well as improving the bureaucratic system, it would be ideal for a legal country to establish clear, common, and, most importantly, respected legal norms. It is, however, necessary to have political will and consistency in order to achieve their implementation. The higher the democracy rate in a country, the less opportunity there is for the corruption mechanism, and the highest rate of corruption is seen in totalitarian countries. Reasons for this are the lack of transparency and private interests preference over public welfare.

Institutional audits are increasingly recognized as an important tool in the fight against corruption. Heller et al. (2016) argue that political systems are poorly designed for institutional audits. The study, however, has the limitation of looking only at legislative audits. The study did not include constitutional courts, certain referendums, or anti-corruption institutions. Several rival parties and open political competition are the best ways to prevent corruption and improve governance, according to the study.

On the other hand, corporations seek corruption through lobbying. According to Campos and Giovannoni (2017), lobbying is a way of gaining political influence and allowing corruption to flourish. Government policies can be influenced significantly by lobbying firms. The importance of institutional audit is once again highlighted by this situation. Institutional audits can also reduce the corrupt behavior of public officials. By achieving these positive developments, public institutions will be more reliable and effective (Ceva and Ferretti, 2017).

Through cultural determinants, Taşar and Çevik (2017) examined informal institutions of corruption. Covering 60 countries was used as the basis for the study, and according to the

results, corruption levels have a positive relationship with obedience to authority, individualism, emphasis on masculinity in national culture, religiosity, and trust in political institutions. On the other hand, nations that prioritize women's rights in terms of family structure and child education have lower levels of corruption.

Acaravci et al. (2018) examined the relationship between institutional quality and foreign direct investment. The study concludes that institutional factors (government stability, law and order, democracy, accountability, bureaucratic quality) positively affect foreign direct investments. The corruption factor, which represents institutional factors, is excluded since corruption shows an exclusionary institution effect and indicates a weak institutional structure.

Obydenkova and Arpino (2018) examined the relationship between corruption and the 2008 global economic crisis in European countries. The study's first finding was that corruption reduced trust in the national parliament during the crisis compared to before 2008. Additionally, it has been found that corruption and trust in the European Union (EU) correlated positively before the crisis. Consequently, states with higher levels of national corruption are more likely to rely on international institutions. However, this relationship disappeared after 2008.

In another study, Barnes and Beaulieu (2019) investigated the relationship between female politicians and corruption. Generally, people have more faith in female politicians in regards to corruption. According to the study, voters perceive women in political institutions as more risk-averse and more constrained by institutional oversight, leading to the perception that women are less likely to commit corruption. The study used the questionnaire method to research gender heterogeneity. The identification of informal institutional mechanisms is crucial to understanding women's role in politics and increasing trust in government.

Liu et al. (2019) examined corruption and entrepreneurship from an institutional perspective. The first finding is that corruption is a legitimate but informal institutional channel that facilitates entrepreneurship in subnational regions with underdeveloped institutional arrangements. It was found, however, that high levels of corruption had a negative impact on entrepreneurship and that corruption had a limited positive relationship with entrepreneurship. According to a nationwide survey on entrepreneurship in China, there is an inverted U-relationship between corruption and entrepreneurship. Therefore, low levels of corruption encourage entrepreneurship in the regions, while high levels discourage it.

A study by Şen (2020) focused on the economic and political factors that influence corruption. Economic determinants include economic growth, market competition, export and import levels, openness and globalization, wage levels, and inflation. Political determinants include the size of the government, the structure of the government, the government system, and e-government. In the study, the economic and political consequences of corruption were examined. In the first economic impact, corruption has both negative and positive effects on growth. Corruption's political consequences include misallocation of public resources, reduction in public revenues, ineffective use of public resources, and thus an increase in public expenditures.

It was also searched for empirical studies on the relationship between institutional quality and corruption in Turkey during the writing of this section, but none were found. Because, as stated in the Data and Analysis section, there is no sufficient publicly available data to

conduct time series analysis for Turkey. In this respect, this study is expected to contribute to the literature in this field.

## 3. Econometric Methodology

When the variables are not normally distributed, traditional estimations are biased. Therefore, whether the variables are normally distributed should be checked before the analysis. If the variables are not normally distributed, the RALS-ADF unit root test and RALS-EG cointegration test, which were used in this study, would be more accurate.

### 3.1. RALS-ADF Unit Root Test

The traditional ADF unit root test equation is:

$$\Delta Y_t = \alpha + \gamma Y_{t-1} + \sum_{i=1}^{p} \delta_i \Delta Y_{t-1} + u_t \quad (1)$$

Applying the RALS procedure to equation 1 yields the RALS-ADF unit root test:

$$\Delta Y_t = \alpha + \gamma Y_{t-1} + \sum_{i=1}^{p} \delta_i \Delta Y_{t-1} + \widehat{w_t}' \varphi + v_t \quad (2)$$

In equation 2, The RALS term ($\widehat{w_t}$) is the information term obtained from the residuals that occur when the errors are not normally distributed. In the RALS-ADF unit root analysis, the determination of the stationarity is made over the $\gamma$ parameter. The null hypothesis of the ADF and RALS-ADF tests is that the series has a unit root (Im et al., 2014).

### 3.2. RALS-EG Cointegration Test

The regression equation for the EG cointegration test is as follows:

$$\Delta\widehat{u_t} = d_{1t} + \delta_1 \hat{u}_{t-1} + \sum_{i=1}^{k} \varphi_i \Delta\hat{u}_{t-1} + e_t \quad (3)$$

The RALS-EG cointegration test is obtained by applying the RALS procedure to equation 4:

$$\Delta\widehat{u_t} = d_{1t} + \delta_1 \hat{u}_{t-1} + \sum_{i=1}^{k} \varphi_i \Delta\hat{u}_{t-1} + \widehat{w_t}' \gamma + e_t \quad (4)$$

In equation 4, the information that the errors are not normally distributed is added to the cointegration model with the $\widehat{w_t}$ term. The $\delta_1$ parameter in this equation is used to determine whether or not there is cointegration. The null hypothesis for the RALS-EG cointegration test is that there is no cointegration relationship ($\delta_1 = 0$) when the errors are not normally distributed. This new cointegration test uses t statistics over the following assumption limit (Lee et al., 2015).

$$t_{REG} \rightarrow \rho . t_{EG} + \sqrt{1-\rho^2} . Z$$

In the equation, $t_{EG}$ is the t statistics for the EG test, and $t_{REG}$ is the t statistics for the RALS-EG cointegration test. The Z term in the equation is the random variable for the standard normal distribution.

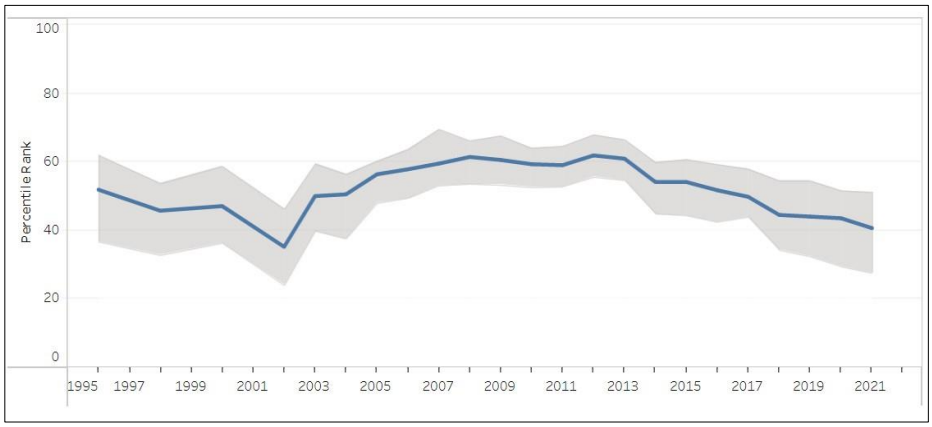
## 4. Data and Analysis

This study examined different periods, and the results are summarized below. It is explained in the literature section that there are varying findings regarding the relationship between institutional quality and corruption. A difference in these results may be due to a difference in the period, the data set, and the method used.

### 4.1. Data

The first studies on corruption analysis were conducted in the 1980s. Corruption data for Turkey were annually prepared and dates back to the mid-1990s. For example, Figure 1 shows control of corruption data obtained from the Worldwide Governance Indicators database of the World Bank. This index measures perceptions of corruption and capture of the state by private interests and elites. The index is rated as percentile rank (ranges from 0 (lowest) to 100 (highest) rank). According to the graph, the corruption index rose in the early 2000s but fell to after 2014. This index dates back to 1996 and was measured every two years until 2002. Since 2002, it has been calculated annually. Similarly, the Transparency International database starts from 1995 and is calculated annually. However, these data could not be used. Because the period covers 25 years, time series analysis will not give robust results.

Figure 1: Control of Corruption

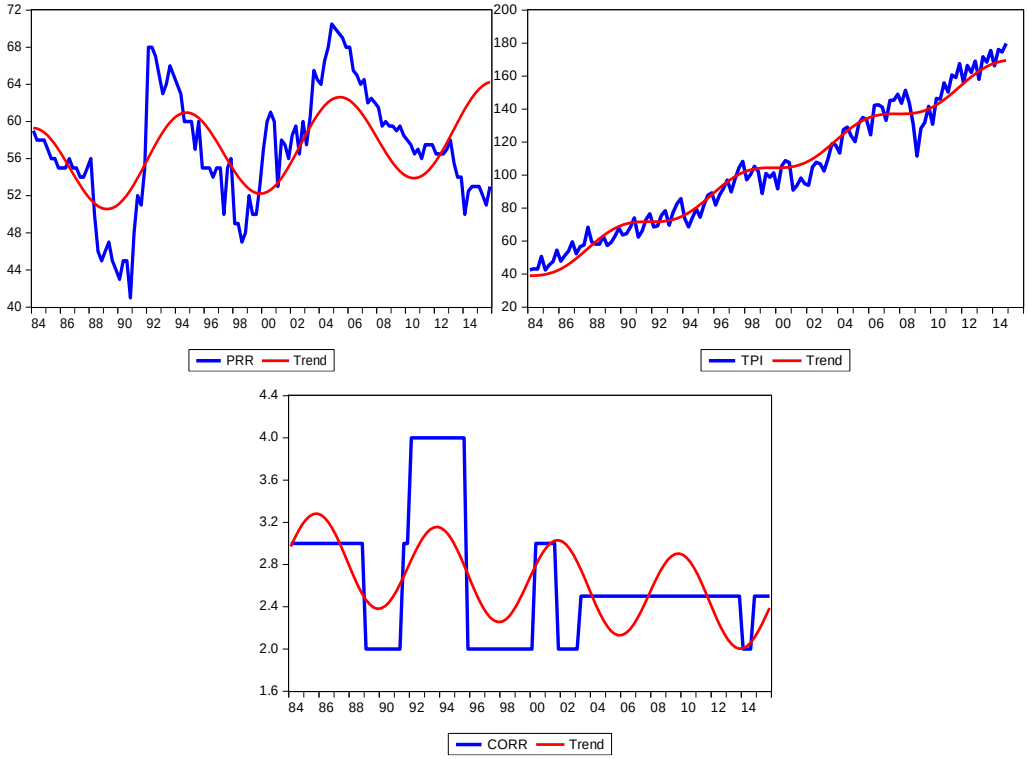



Source: Worldwide Governance Indicators

Quarterly data of Turkey between 1984 and 2015 were used in the analysis. The variables used are the political risk rating, corruption, and the total production index. The political risk rating and corruption variables were obtained from the International Country Risk Guide (ICRG) database, and the total production index data was obtained from the Central Bank of the Republic of Turkey. Quarterly use of the data set was preferred to increase the power of the tests. In addition, the data set is important in considering both the coalition periods and the single-party period of Turkey after 1980. The post-2015 period was not included in the analysis because it included a coup attempt and a change in the management system. The total production index[2], which is used as a control variable in the cointegration test, was chosen to represent the national income and the size of the public. The variables related to national income and the size of the public sector could not be used directly in the analysis since they started to be prepared quarterly towards the end of the 1990s. Variables used in the model are presented in Figure 2.

[2] The total production index starts from 1985.

Figure 2: Variables in the Model




Source: It was prepared using the mentioned databases by the author.

In Figure 2, the corruption variable is defined as CORR, political risk rating as PRR, and total production index as TPI. The PRR[3] measures the political risks of countries and is used as an independent variable in our model to represent institutional quality. When glancing at the PRR's components, it is clear that many different factors are evaluated within this variable, and as a result, PRR represents the institutional structure's quality. If a country's PRR score is below 50, it is considered to have very high risk, between 50 and 60 high risk, 60-70 moderate risk, 70-80 low risk, and 80-100 very low risk. When looking at the path of the PRR in Turkey, a fluctuating graph emerges. Throughout the 1990s, risks tended to rise, but the risks started to decrease as of the early 2000s. Political risks have increased following the global financial crisis. Despite the general trend appearing to be a fixed line, looking at the Fourier trend reveals gradual upward and downward breaks. These breaks indicate that the political risk is not a static factor, and it is subject to change. This means that it is important to monitor the political risk environment and adjust strategies accordingly.

[3] According to the ICRG methodology, the components of PRR are: government stability, socio-economic conditions, investment profile, internal and external conflicts, corruption, military dominance in politics, religious and ethnic tensions, law and order, democratic accountability, and the bureaucracy quality. https://www.prsgroup.com/wp-content/uploads/2012/11/icrgmethodology.pdf (Accessed: 20.12.2021)

Another independent variable in our model, the TPI index, showed a rising trend. The upward trend is also characterized by seasonality. Growth rates in the 1990s were relatively slow compared with the 2000s. Production is affected by both the Turkish economic crisis and the crises of foreign countries. Following the global financial crisis, the TPI increased significantly. The TPI index has been steadily increasing since the beginning of the 2010s, with a few minor fluctuations. This trend is expected to continue in the future, as the Turkish economy continues to expand and foreign trade increases. This suggests that the TPI index is highly sensitive to external and internal economic events, demonstrating its potential as a leading indicator for production in the Turkish economy.

CORR, which is used as a dependent variable, measures corruption in the system. The ICRG methodology states that corruption poses a threat mainly to foreign investors, distorts the economic and financial environment, reduces efficiencies, and ultimately creates internal instability. The corruption index is scored between 0-6. Especially in the 1990-1996 period, the corruption score increased to 4, and the risks in this area increased considerably. In the 2000s, the average corruption index is progressing at 2.5 points. The current score of 2.5 is still considered high, and highlights the fact that corruption continues to be an issue in Turkey. Accordingly, CORR follows a Fourier trend with more frequent and severe breaks and a slight downtrend. CORR remained constant for some periods. Based on this, it has a gradual changing structure than other variables. Due to its lack of sharp peaks and troughs, CORR is not as volatile as other variables, which makes its changing structure comparatively more complex. Therefore it requires careful analysis and monitoring to identify any significant changes. It is important that governments and businesses take proactive steps to address this issue to ensure a safe and fair investment environment.

### 4.2. Analysis and Findings

The correlation between the CORR and PRR variables is 0.451 for 1984Q1-2015Q4 but 0.725 for 1984Q1-2002Q3, including coalition periods. The two periods will be analyzed separately due to the significant difference in correlation coefficients. In our analysis, it is expected that there will be a relationship between institutional quality and corruption, especially in the coalition period. Because the political instability caused by the ever-changing coalition governments in the 1990s prevented the effective functioning of the audit mechanism, and corruption increased (Colella, 2020: 38-41).

### 4.3. Findings Regarding the Entire Period

In this section, the period 1984Q1-2015Q4 has been analyzed. First, normality tests for the variables were carried out with the Jarque-Bera normality test. This test determines whether the regression residuals of the sample data have a normal distribution. The null hypothesis of this test is that the variables are normally distributed. The results are given in Table 1.

Table 1: Jarque-Bera Test Results

| Variable | Level<br>JB statistics | p-value |
|---|---|---|
| PRR | 0.358 | 0.835 |
| CORR | 22.098 | 0.000 |
| TPI | 6.647 | 0.032 |

It can be seen from Table 1 that the PRR variable follows a normal distribution. CORR and TPI are not normally distributed since the null hypothesis is rejected. Therefore, the RALS-ADF unit root test should be preferred.

RALS-ADF unit root test results are shown in Table 2. The model with constant was chosen for this analysis[4].

Table 2: RALS-ADF Unit Root Test Results

| Variables | Level t-statistics | Rho | First Difference t-statistics | Rho |
|---|---|---|---|---|
| PRR | -2.531 | 0.747 | -13.698 | 0.755 |
| CORR | -0.725 | 0.302 | -20.402 | 0.298 |
| TPI | -0.470 | 0.744 | -17.905 | 0.158 |

Note: The critical values at the significance levels of 1%, 5% and 10%, respectively: -2.957, -2.289, -1.933 for the 0.2 rho value; -3.061, -2.402, -2.060 for the 0.3 rho; -3.344, -2.732, -2.419 for the 0.7 rho value; -3.391, -2.781, -2.465 for the 0.8 rho value.

A comparison is made between the results in Table 2 and the critical values. Due to the non-rejection of the null hypothesis for all variables, the series have a unit root and are non-stationary. As soon as the first differences of the variables are compared with the critical values, it is determined that all the variables become stationary. Therefore, all variables in the model are I(1). Since the variables are stationary at the same level, the existence of a long-term relationship can be determined using the RALS-EG cointegration test. Table 3 presents the results of this test.

Table 3: RALS-EG Cointegration Test Results

| | Test Statistics | Rho |
|---|---|---|
| RALS-EG (Constant) | -0.648 | 0.477 |
| RALS-EG (Constant and Trend) | -1.161 | 0.58 |

Note: Critical values of RALS-EG test at 1%, 5%, and 10% significance levels for 0.5 rho for the model with constant: -3,887, -3,246, -2,909. Critical values of RALS-EG test at 1%, 5%, and 10% significance levels for 0.6 rho for the model with constant and trend: -4.302, -3.689, and -3.357.

When the results of Table 3 are examined, the null hypothesis cannot be rejected in the model with constant and in the model with constant and trend. According to both RALS-EG tests, there is no long-term cointegration relationship between the variables.

### 4.4. Findings Regarding the Coalition Period

This section covers the years 1984Q1 to 2002Q3. In the continuation of the study, this period is called the "coalition period." Corruption has been prominent in coalition governments formed by various parties in Turkey during the 1990s (Çakır, 2020). This is why the coalition period was studied separately. A higher correlation exists between PRR and CORR variables in the coalition period than in the entire period. Findings are expected to reveal a cointegration between corruption and institutional structure. The method used in

[4] When the graphs of the series are examined, it seems more appropriate to use the model with constant. In addition, the reason for choosing the model with constant is that the variables become stationary at the first level in both the RALS-ADF unit root test and the ADF unit root test. According to the RALS-ADF unit root test results in the model with constant and trend, the variables do not become stationary even at the second level.

this section is the same as in the previous section. First, the normality test of the variables was performed, and the results are presented in Table 4.

Table 4: Jarque-Bera Test Results in the Coalition Period

| Variables | Level JB statistics | p-value |
|---|---|---|
| PRR | 0.504 | 0.777 |
| CORR | 6.298 | 0.042 |
| TPI | 1.641 | 0.440 |

When Table 4 is examined, the PRR variable is normally distributed, similar to the results of the entire period. However, CORR and TPI variables are not normally distributed. Likewise, the RALS-ADF unit root test was preferred for the analysis.

The RALS-ADF with constant unit root test results are shown in Table 5.

Table 5: RALS-ADF Unit Root Test Results in the Coalition Period

| Variables | Level t-statistics | Rho | First Difference t-statistics | Rho |
|---|---|---|---|---|
| PRR | -2.451 | 0.762 | -9.926 | 0.755 |
| CORR | 0.030 | 0.286 | -15.857 | 0.298 |
| TPI | -1.058 | 0.892 | -21.155 | 0.158 |

Note: The critical values at the significance levels of 1%, 5% and 10%, respectively: -2.957, -2.289, -1.933 for the 0.2 rho value; -3.061, -2.402, -2.060 for the 0.3 rho; -3.344, -2.732, -2.419 for the 0.7 rho value; -3.444, -2.845, -2.529 for the 0.9 rho value.

According to the results obtained in Table 5, all variables have unit roots in the coalition period. When the first difference of the variables is taken, it is determined that they become stationary. The variables are stationary at the same level in the coalition period, and the RALS-EG cointegration test was used in the analysis. The results are given in Table 6.

Table 6: RALS-EG Cointegration Test Results in the Coalition Period

| | Test Statistics | Rho |
|---|---|---|
| RALS-EG (Constant) | -3.147 | 0.959 |
| RALS-EG (Constant and Trend) | -2.788 | 0.915 |

Note: Critical values of RALS-EG test at 1%, 5%, and 10% significance levels for 1 rho for the model with constant: -4.428, -3.808, -3.492. Critical values of RALS-EG test at 1%, 5%, and 10% significance levels for 0.9 rho for the model with constant and trend: -4.687, -4.092 and -3.764.

According to the results of Table 6, the null hypothesis cannot be rejected in both RALS-EG models. As a result, there is no long-term cointegration relationship between the variables in the coalition period.

## 5. Conclusions and Discussion

This study examines the relationship between corruption and the quality of Turkey's institutional structure. The importance of institutional structure and the rule-based and accountable functioning of political processes in combating corruption is stressed, as better institutional quality leads to a reduction of corruption and a boost in economic growth.

An econometric analysis was conducted using quarterly data from 1984 to 2015 to reveal the relationship between institutional quality and corruption in Turkey. The RALS-ADF unit root test and the RALS-EG cointegration test were used, both newly developed techniques. Among the variables used, CORR was the dependent variable, PRR was the independent variable, and TPI was the control variable.

Analyses are divided into two parts. As part of the first analysis, the entire period 1984-2015 was taken into account. During this time period, both coalitions and single-party governments were in power. The second analysis used only the data between 1984 and 2002, including the coalition period. There was no cointegration relationship between corruption level and institutional quality in both analyses. The findings are similar to those from Aidt et al. (2008), Meon and Sekkat (2005), and Meon and Weill (2010). Turkey has a medium or high political risk level, based on the PRR variable's overall trend. There is a need to enhance the quality of Turkish institutions based on these statistics. Consequently, institutional structure and corruption do not have a long-term relationship. Moreover, production level is neither positively nor negatively connected with corruption in the long run.

As a result of the findings, it is necessary to improve the quality of our country's institutional structure first. In the long run, higher economic performance can be achieved by developing corruption control, property rights, and fundamental rights and freedoms in Turkey. A key component of Turkey's improved economic performance is the development of its institutional structure, particularly between 2002 and 2007. Due to the post-crisis slowdown in the EU process, institutional reforms and property rights could not be continued. This led to fluctuations in economic indicators (Çiçen, 2019).

In addition, limited progress has been made in the fight against corruption in Turkey in recent years (Hayaloğlu and Artan, 2014: 361-362). Future empirical studies should examine the determinants and significant factors that influence corruption levels in Turkey. In light of the findings, it will be possible to identify institutional factors that can help reduce corruption. This will result in the development of new policies and corruption prevention strategies.

## References

Abed, M. G. T. & Gupta, M. S. (2002), Governance, Corruption, and Economic Performance. Washington: International Monetary Fund.

Acaravcı, A., Artan, S., Erdoğan, S. & Göktürk, T. B. (2018), "Türkiye'de Kurumsal Kalite, Reel Gelir ve Doğrudan Yabancı Yatırımlar İlişkisi", Mehmet Akif Ersoy Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, Vol. 5, No. 2: 132-145.

Aidt, T., Dutta, J. & Sena, V. (2008), "Governance Regimes, Corruption and Growth: Theory and Evidence", Journal of Comparative Economics, Vol. 36, No. 2: 195-220.

Artan, S. & Hayaloğlu, P. (2014), "Kurumsal Yapı ve İktisadi Büyüme İlişkisi: Türkiye Örneği", Sosyoekonomi, Vol. 22, No. 2: 347-365.

Bardhan, P. (1997), "Corruption and Development: A Review of Issues", Journal of Economic Literature, Vol. 35, No. 3: 1320-1346.

Barnes, T. D. & Beaulieu, E. (2019), "Women Politicians, Institutions, and Perceptions of Corruption", Comparative Political Studies, Vol. 52, No. 1: 134-167.

Breen, M. & Gillanders, R. (2012), "Corruption, Institutions and Regulation", Economics of Governance, Vol. 13, No. 3: 263-285.

Broadman, H. G. & Recanatini, F. (2001), "Seeds of Corruption–Do Market Institutions Matter?." MOST: Economic Policy in Transitional Economies, Vol. 11, No. 4: 359-392.

Brol, M. (2016), "Institutional Determinants of Corruption", Ekonomia i Prawo. Economics and Law, Vol. 15, No.1: 21-32.

Campos, N. F., Dimova, R., & Saleh, A. (2016). "Corruption and Economic Growth: An econometric survey of the evidence", Journal of Institutional and Theoretical Economics, Vol. 172, No. 3: 521-543.

Campos, N. F. & Giovannoni, F. (2017), "Political Institutions, Lobbying and Corruption", Journal of Institutional Economics, Vol. 13, No. 4: 917-939.

Ceva, E. & Ferretti, M. P. (2017), "Political Corruption", Philosophy Compass, Vol. 12, No. 12, e12461.

Çiçen, Y. B. (2019), "Türkiye'nin 1980 Sonrası Kurumsal Yapısındaki Değişimi ve Ekonomik Sonuçları", Hacettepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, Vol. 37, No. 3: 423-438.

Colella, D. S. (2020), "Türkiye-Avrupa Birliği (AB) İlişkilerinde 1990'lı Yılların Analizi", Uluslararası Sosyal Bilimler Akademi Dergisi, Vol.3: 26-56.

Collier, M. W. (2002), "Explaining Corruption: An Institutional Choice Approach", Crime, Law and Social Change, Vol. 38, No. 1: 1-32.

Çakır, E. M. (2020), "1991-2002 Yılları Arasında Koalisyon Hükümetleri Yönetimi", IBAD Sosyal Bilimler Dergisi, Vol. 6: 19-37.

De Vaal, A. & Ebben, W. (2011), "Institutions and the Relation between Corruption and Economic Growth", Review of Development Economics, Vol. 15, No. 1: 108-123.

Dreher, A., Kotsogiannis, C. & McCorriston, S. (2009), "How Do Institutions Affect Corruption and the Shadow Economy?", International Tax and Public Finance, Vol. 16, No. 6: 773.

Türkiye Cumhuriyet Merkez Bankası Elektronik Veri Dağıtım Sistemi, https://evds2.tcmb.gov.tr/ (Access: 30.11.2020).

Emek, U. & Acar, M. (2008), "Yolsuzlukla Mücadelede Bir Temel Soru(n): Kurumsal Tekelcilik mi, Çoğulculuk mu?.", İktisat İşletme ve Finans, Vol. 23, No. 270: 64-89.

Fjelde, H. & Hegre, H. (2014), "Political Corruption and Institutional Stability", Studies in Comparative International Development, Vol. 49, No. 3: 267-299.

Fritzen, S. (2005), "Beyond "Political Will": How Institutional Context Shapes the Implementation of Anti-Corruption Policies", Policy and Society, Vol. 24, No. 3: 79-96.

Gerring, J. & Thacker, S. C. (2004), "Political Institutions and Corruption: The Role of Unitarism and Parliamentarism", British Journal of Political Science, Vol. 34, No: 2: 295-330.

Heckelman, J. C. & Powell, B. (2010), "Corruption and the Institutional Environment for Growth", Comparative Economic Studies, Vol. 52, No. 3: 351-378.

Heller, W. B., Kyriacou, A. P. & Roca-Sagalés, O. (2016), "Institutional Checks and Corruption: The Effect of Formal Agenda Access on Governance", European Journal of Political Research, Vol. 55, No.4: 681-701.

Hope Sr, K. R. (2017), "Fighting Corruption in Developing Countries: Some Aspects of Policy from Lessons from the Field", Journal of Public Affairs, Vol. 17, No. 4, e1683.

Im, K. S., Lee, J. & Tieslau, M. A. (2014), "More Powerful Unit Root Tests with Non-Normal Errors", (Ed. R.C. Sickles and W.C. Horrace), Festschrift in Honor of Peter Schmidt, New York: Springer: 315-342.

International Country Risk Guide, https://epub.prsgroup.com/index.php/country-database/country-data, (Access: 26.11.2020).

LaPalombara, J. (1994), "Structural and Institutional Aspects of Corruption", Social Research, Vol. 61, No. 2: 325-350.

Lederman, D., Loayza, N. V. & Soares, R. R. (2005), "Accountability and Corruption: Political Institutions Matter", Economics & Politics, Vol. 17, No. 1: 1-35.

Lee, H., Lee, J. & Im, K. (2015), "More Powerful Cointegration Tests with Non-normal Errors", Studies in Nonlinear Dynamics & Econometrics, Vol. 19, No. 4: 397-413.

Liu, J., Hu, M., Zhang, H. & Carrick, J. (2019), "Corruption and Entrepreneurship in Emerging Markets", Emerging Markets Finance and Trade, Vol. 55, No. 5: 1051-1068.

MacIntyre, A. (2003), "Institutions and the Political Economy of Corruption in Developing Countries", Workshop on Corruption, Stanford University, Vol. 31.

Mauro, P. (1995), "Corruption and Growth", The Quarterly Journal of Economics, Vol. 110, No. 3: 681-712.

Méon, P. G. & Sekkat, K. (2005), "Does Corruption Grease or Sand the Wheels of Growth?." Public Choice, Vol. 122, No. 1-2: 69-97.

Méon, P. G. & Weill, L. (2010), "Is Corruption an Efficient Grease?." World Development, Vol. 38, No. 3: 244-259.

Murphy, K. M., Shleifer, A. & Vishny, R. W. (1991), "The Allocation of Talent: Implications for Growth", The Quarterly Journal of Economics, Vol. 106, No. 2: 503-530.

Obydenkova, A. V. & Arpino, B. (2018), "Corruption and Trust in the European Union and National Institutions: Changes over the Great Recession across European States", JCMS: Journal of Common Market Studies, Vol. 56, No. 3: 594-611.

Oral, B. G. (2011), "Yolsuzlukla Uluslararası Alanda Mücadele ve Türkiye'de Yolsuzlukla Mücadelenin Kurumsal Yapısı", Marmara Üniversitesi İktisadi ve İdari Bilimler Dergisi, Vol. 30, No. 1: 163-192.

Shah, A. & Schacter, M. (2004), "Combating Corruption: Look Before You Leap", Finance and Development, Vol. 41, No. 4: 40-43.

Şen, S. (2020), "Yolsuzluk Ekonomi ve Devlet Üzerine Bir İnceleme", Kamu Politikalarında Mali ve İktisadi Yapıdaki Dönüşüm: Yerelden Globale Teori, Beklentiler ve Uygulama, (Ed. Ş. Karabulut), Ankara: Gazi Kitabevi: 387-407.

Taşar, M. O. & Çevik, S. (2017), "Yolsuzluk ve Rüşvetin Kültürel Belirleyicileri", Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, Vol.38: 140-153.

Uberti, L. J. (2016), "Can Institutional Reforms Reduce Corruption? Economic Theory and Patron–client Politics in Developing Countries", Development and Change, Vol. 47, No. 2: 317-345.

Venard, B. (2013), "Institutions, Corruption and Sustainable Development", Economics Bulletin, Vol. 33, No. 4: 2545-2562.

Worlwide Governance Indicators, http://info.worldbank.org/governance/wgi/, (Access: 23.11.2020).