

## Economic Growth and Corruption: Differential Dynamics in Developed and Developing Countries

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### ABSTRACT

**Purpose** - The aim of this research is to analyze the relationship between the corruption perceptions and economic growth. For the purposes of the research, it has been examined whether the relationship in question differs in developed and developing countries.

**Design/methodology/approach** - In this context, analyzes were made within the framework of panel data analysis using annual frequency data between 2009 and 2020 for 25 developing countries and 23 developed countries grouped within the scope of the World Bank country classification. Panel data analysis was performed separately to cover both the specified period and the pre-covid period. The gross domestic product variable used for economic growth is the dependent variable, and the corruption perception index variable, which is used as corruption, is used as the independent variable. Foreign direct investments, consumer price index taken as inflation, and foreign trade volume variables were used as explanatory variables. The study is based on the expectation that corruption negatively affects economic growth. Both level values and return values were used to make comparisons. 3 models were created on 2 different fictions.

**Findings** - As a result of the analysis of the relationship between corruption and economic growth in the first scenario, no statistically significant effect was found for all countries, developed countries and developing countries in the entire period and pre-Covid period. Within the scope of the second construct, the relationship between corruption and economic growth was found to be statistically significant and positive at the 10% and 1% significance level in the developed countries group in the entire period and in the pre-Covid period, which is in the same direction as the expectation. In the group of developing countries, the relationship between corruption and economic growth was statistically significant for all periods, and it was concluded that corruption increases economic growth.

**Discussion**- The results differ for both the covid period and the pre-covid period for developed and developing countries. In the developing country group, the results for all periods are opposite to expectations. When the results are examined in the general literature, it is noteworthy that while they support some studies, they also differ from some studies.

## 1. Introduction

The simplest definition of corruption was made by the World Bank, which initially saw the concept of corruption as a political problem internal to countries, but has come to the fore with its work in the fight against corruption as it has reached a point where it has been increasing and producing negative results. In short, corruption is the abuse of public office for private gain.

The concept of "corruption" appears as one of the factors affecting economic growth in both developed and developing countries. In the last two to three decades, corruption has become a prominent problem in many countries, especially in developing countries where it has serious effects on the economy.

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Studies examining the relationship between corruption and the level of economic growth of countries in the literature seem to support two different views. A group of studies argues that bribery is a concept that ensures the functioning of the system that does not progress by removing some bureaucratic obstacles and triggers growth in the economy in this way. This approach is referred to as "Grease the Wheels" in the literature (Meon and Sekkat, 2005:70). In the approach that argues the opposite of this hypothesis, it is stated that corruption negatively affects economic growth, in addition to this, inequality in income distribution, decrease in investments, ineffective management in the public sector, etc. issues are also noted. (Shabbir, 2017:102). Corruption has a negative impact on the economy as public resources are used for private purposes and personal benefits, rather than for social benefit. This approach appears in the literature in the form of "getting the wheels stuck in the sand".

In this context, the fact that the interaction between corruption and economic growth is based on a theory has been effective in the decision to study this subject and has been found remarkable as it is a topic that is always on the agenda at the global level. On the other hand, although the studies in the literature have generally examined the relationship between direct economic growth and corruption, it is thought that this study will contribute to the literature by analyzing it separately, covering the pre-covid and all periods.

In this study, the relationship between corruption and economic growth is examined by using panel data analysis for the developed and developing countries group, using data from 2009-2020. The gross domestic product variable used for economic growth is the dependent variable, and the corruption perception index variable, which is used as corruption, is used as the independent variable. Foreign direct investments, consumer price index taken as inflation and foreign trade volume variables were used as explanatory variables. Democracy index and political stability index variables were considered as independent variables in the analysis, which was designed as 3 different models. All variables were considered as both return values and level values, and the results within the specified years were analyzed to cover both the whole period and the Covid period. Within the scope of Model 1, it has been determined that there is no statistically significant effect of corruption on economic growth for the pre-covid period and all periods. Within the scope of Model 2, it was concluded that corruption affects economic growth negatively before covid and in all periods.

There are studies in the literature examining the relationship between economic growth and corruption. It is thought that this study will contribute to the literature as it is analyzed separately to cover all periods and before covid.

## 2. Literature Review and The Concept of Corruption

Corruption is when public officials use their power for personal gain against the rules of the game (Jain, 2001). According to this definition, for the emergence and continuation of corruption, the public official must have the authority, and the political, administrative and legal institutions must have a structure that encourages the authorities to use their discretion and power of disposition in a way that will generate or create an income.

There are studies in the literature that analyze the relationship between corruption and economic growth with different econometric methods (Mo, 2001; Huang, 2012; Brempong, 2002; Drury et al., 2006; Monte and Papagnini, 2001; Mauro, 1995; Ondo, 2017; Gründler and Potrafke, 2019; Baclouti and Boujelbene 2020; Song et al. 2021). The common conclusion of all these studies is that corruption negatively affects economic growth.

The "grease the wheel" argument has been validated by only a few scholars in studies using theoretical or qualitative research, such as Leff (1964), Huntington (1968), Myrdal (1968), and Leys (1965). It has been argued that corruption practices reduce friction by working like grease on wheels, while bureaucracy hinders economic growth. Leff (1964) is one of the pioneering studies that contribute to the subject in the literature.

Rose-Ackerman (1978) and Lui (1985) argued that practices related to corruption minimize the waiting costs of those who value time more. Similarly, Beck and Maher (1986) and Lien (1986) show that the most efficient firms can afford the largest bribes, thus minimizing bureaucratic costs. In the history of Europe and the USA, Bardhan (1997) stated that corruption helps development. More recently, Dreher and Gassebner (2013) stated that corruption practices facilitate the entry of companies into the economic system and were expressed as the second best solution against inefficient bureaucracy that hinders investments, Ondo (2017) concluded in his study that corruption triggers economic development.

The "sand" argument appears to be supported by more robust empirical evidence. According to this view, corruption acts as an uncertainty and a cost-increasing factor. This argument was pioneered by Mauro (1995), who evaluated the impact of corruption on economic growth through country analysis and found a significant negative causal relationship. Their findings were also confirmed by Mo (2001) and Pellegrini and Gerlagh (2004). However, within the framework of the sand argument, it is important to understand the channels through which corruption has an impact on economic growth. The private investment channel is one of the most explored channels because public officials focus on rent-seeking activities in the often discretionary provision of public services, which eventually leads to a misappropriation of resources in financial and human capital. More specifically, corruption undermines investment Mauro (1995), Mo (2001) Baumol (1990), Murphy et al. (1991), Lui (1996) Lambsdorff (1998). In addition, Murphy et al. (1993) argued that corruption discourages investment in innovation because ruling oligarchies support incumbents in exchange for bribes and increase entry barriers for potential innovations.

The effect of corruption on economic development is realized through different channels. One of them is investments. The excess of corruption negatively affects the efficiency and profitability of investments (Bardhan, 1997:1328). Corruption is mostly seen in public investments, increasing public investments with low efficiency and indirectly causing less private investments. According to Carjaval (1999), there are three other channels of corruption other than investment that affect economic development. One of them is human capital and the other is the concepts of crime and political instability.

### 3. Data and Method

The research models to be analyzed within the scope of the research are expected to be estimated on the level values of the variables in the first stage, and on the return series calculated for the same variables in the second stage. In this context, the research models that are required to be solved are expressed with the equation set in equations 1-6.

In order to provide a comparison opportunity, other variables that are thought to have an effect on corruption other than economic growth were also selected as explanatory variables.

Definitions of economic variables in the research model are given in Table 1.

**Table 1.** Variable Definitions

Variable	Symbol
Gross domestic product	GDP
Corruption Perceptions Index	CORR
Foreign Direct Investments	FDI
Consumer price index	CPI
Foreign trade	TRD
Democracy Index	DI
Political Stability Index	PSI

A balanced panel data set was created by collecting the observations of all the variables in Table 1 at an annual frequency between 2009 and 2020 for 25 developing countries and 23 developed countries. GDP (gross domestic product) used in the model, data from World Bank World Development Indicator database, TRD (foreign trade) data from World Bank National Account Data and OECD Account Data database, FDI (foreign direct investments) data from IMF Datamapper database, CPI (consumer price index) data were obtained from Economic Research Fred Economic Data database, CORR (corruption perception index) data were obtained from Transparency International (Transparency International). Democracy index and political stability index data were obtained from the "Business and Economic Data" platform.

Observations of the variables in the research model were collected completely between 2009 and 2020. Considering the time dimension covered by the research, it is seen that it is short and includes 12 observations. It is seen that micro-panel definition is made in the literature for panel datasets with time dimension with such few observations, and it is known that there is no danger of spurious regression due to non-stationary time

dimension in panel data econometrics (Baltagi, 1995, p.237-238). For this reason, it was not necessary to apply unit root tests by ignoring the stationarity processes of the variables.

The research model used in the analysis is the growth model used by Barro (1991) in his study on economic growth. The basic model is “ $\ln y = \alpha + \beta_k \ln z + \mu$ ”. It is seen that this growth model has been used in many studies in the literature, some of which are given below: Ho and Huang’s (2011) study on the relationship between corruption and economic growth on Bric countries, Huang’s (2012) study on corruption, economic growth and income inequality in Asian countries, Lim and Kim’s (2015) study on corruption and economic growth in South Korea, Muratoğlu’s (2011) study on the relationship between growth and employment in the case of Turkey, Bozoklu and Yılancı’s (2013) study on the causality relationship between financial development and economic growth.

### Model 1: Variable Level Values

The research models to be estimated with the level values of the variables are expressed with the equation set 1-3.

#### Model 1.1

$$\text{LNGDP}_{i,t} = \alpha_{i,t} + \beta_1 \text{LNCORR}_{i,t} + \beta_2 \text{LNFDI}_{i,t} + \beta_3 \text{LNCPI}_{i,t} + \beta_4 \text{LNTRD}_{i,t} + \varepsilon_{i,t} \quad (1)$$

#### Model 1.2

$$\text{LNGDP}_{i,t} = \alpha_{i,t} + \beta_1 \text{LNFDI}_{i,t} + \beta_2 \text{LNCPI}_{i,t} + \beta_3 \text{LNPSI}_{i,t} + \beta_4 \text{LNTRD}_{i,t} + \varepsilon_{i,t} \quad (2)$$

#### Model 1.3

$$\text{LNGDP}_{i,t} = \alpha_{i,t} + \beta_1 \text{LNFDI}_{i,t} + \beta_2 \text{LNCPI}_{i,t} + \beta_3 \text{LNDI}_{i,t} + \beta_4 \text{LNTRD}_{i,t} + \varepsilon_{i,t} \quad (3)$$

### Model 2: Variable Return Values

The models that are desired to be estimated over the variable return series obtained from the first cyclical differences of the variables and also equal to the percent growth can be expressed with the equations between equations 4-6.

#### Model 2.1

$$\Delta \text{LNGDP}_{i,t} = \alpha_{i,t} + \beta_1 \Delta \text{LNCORR}_{i,t} + \beta_2 \Delta \text{LNFDI}_{i,t} + \beta_3 \Delta \text{LNCPI}_{i,t} + \beta_4 \Delta \text{LNTRD}_{i,t} + \varepsilon_{i,t} \quad (4)$$

#### Model 2.2

$$\Delta \text{LNGDP}_{i,t} = \alpha_{i,t} + \beta_1 \Delta \text{LNFDI}_{i,t} + \beta_2 \Delta \text{LNCPI}_{i,t} + \beta_3 \Delta \text{LNPSI}_{i,t} + \beta_4 \Delta \text{LNTRD}_{i,t} + \varepsilon_{i,t} \quad (5)$$

#### Model 2.3

$$\Delta \text{LNGDP}_{i,t} = \alpha_{i,t} + \beta_1 \Delta \text{LNFDI}_{i,t} + \beta_2 \Delta \text{LNCPI}_{i,t} + \beta_3 \Delta \text{LNDI}_{i,t} + \beta_4 \Delta \text{LNTRD}_{i,t} + \varepsilon_{i,t} \quad (6)$$

The symbol  $\Delta$  in the equations is the first difference operator and shows that the variables are handled with their periodic differences. Other symbols are as described for equation 1-3.

## 4. Analysis and Findings

Since the variables in the study were modeled separately for level values and return values, descriptive statistics of the variables were reported separately for the level values and return values of the variables.

It is expected that there will be a conceptually negative relationship between corruption and growth. Within the framework of the analysis, it is expected that there will be a positive relationship between the LNCORR and LNGDP variables in terms of the content of the CORR variable. The fact that the CORR variable, which expresses the corruption perception index, is close to 100 on the 1-100 scale, indicates that the perception of corruption is low, and increases in the variable are expected to affect the GDP variable in an upward direction.

It is expected that there will be a conceptually positive relationship between Foreign Direct Investments, Consumer Pricing, Foreign Trade, Democracy Index and Political Stability Index and gross domestic product.

The correlation matrix for variables at level values is as in Table 2.

**Table 2.** Correlation Matrix Between Level Values

	GDP	CORR	FDI	CPI	PSI	DI	TRD
GDP	1.000 -						
CORR	0.164*** (0.000)	1.000 -					
FDI	-0.103** (0.013)	0.131*** (0.002)	1.000 -				
CPI	-0.027 (0.522)	-0.225*** (0.000)	-0.044 (0.290)	1.000 -			
PSI	0.018 (0.669)	0.799*** (0.000)	0.195**** (0.000)	-0.270*** (0.000)	1.000 -		
DI	0.129*** (0.002)	0.764*** (0.000)	0.072* (0.083)	-0.190*** (0.000)	0.746*** (0.000)	1.000 -	
TRD	-0.286*** (0.000)	0.175*** (0.000)	0.665*** (0.000)	-0.183*** (0.000)	0.315*** (0.000)	0.119*** (0.004)	1.000 -

\*\*\*(%1), \*\*(%5), \*(%10) indicates statistical significance at the significance level, (the brackets contain significance values.)

The correlation matrix for variables in return values is as in table 3.

**Table 3.** Return Inter-Value Correlation Matrix

	$\Delta$ GDP	$\Delta$ CORR	$\Delta$ FDI	$\Delta$ CPI	$\Delta$ PSI	$\Delta$ DI	$\Delta$ TRD
$\Delta$ GDP	1.000 -						
$\Delta$ CORR	-0.062 (0.152)	1.000 -					
$\Delta$ FDI	0.026 (0.549)	0.020 (0.641)	1.000 -				
$\Delta$ CPI	0.050 (0.256)	0.054 (0.214)	0.035 (0.417)	1.000 -			
$\Delta$ PSI	0.118*** (0.006)	0.027 (0.535)	-0.011 (0.802)	0.014 (0.745)	1.000 -		
$\Delta$ DI	0.238*** (0.000)	-0.016 (0.716)	0.035 (0.418)	0.048 (0.270)	-0.033 (0.449)	1.000 -	
$\Delta$ TRD	0.025 (0.575)	-0.072 (0.100)	0.065 (0.135)	0.085* (0.052)	0.008 (0.858)	0.071 (0.105)	1.000 -

\*\*\*(%1), \*\*(%5), \*(%10) indicates statistical significance at the significance level, (the brackets contain significance values.)

Model 1.1. estimation results for; it is seen that there is no statistically significant effect of the LNCORR variable on the LNGDP variable for both the whole period and the pre- Covid period.

A statistically significant effect of corruption on economic growth for all countries, for developing countries and for developed countries both for the whole period and the pre- covid period. concluded that it is not.

Model 1.2 and Model 1.3 estimation results for; when the coefficients of the other variables common to models 1.2 and 1.3 and model 1.1 are examined, it is seen that there is no major difference between the coefficients in model 1.1 and statistical significance, while there are very small changes in the coefficients.

It is expected that there will be a conceptually negative relationship between corruption and growth. Within the framework of the analysis, it is expected that there will be a positive relationship between the  $\Delta\text{LNCORR}$  and  $\Delta\text{LNGDP}$  variables in terms of the content of the CORR variable. Corruption has direct and indirect negative effects on economic growth. The level of corruption affects negatively by preventing the entry of foreign direct investments, reducing public revenues, preventing the directing and efficient use of public expenditures, triggering inequality in income distribution, supporting the informal economy, and triggering price instability. In this context, the relationship between the CORR variable and the GDP variable is expected to be positive. The fact that the CORR variable, which expresses the corruption perception index, is close to 100 on the 1-100 scale, indicates that the perception of corruption is low, and it is expected that the increase in the variable will affect the GDP variable in an upward direction. Model 2.1 estimation results for; it is seen that the  $\Delta\text{LNCORR}$  variable has a statistically significant and negative effect on the  $\Delta\text{LNGDP}$  variable at the 1% significance level for the 2010-2020 and 2010-2018 periods. The % increases in the Corruption index have a negative effect on economic growth throughout all the periods discussed for these countries. In this case, the result obtained is in the opposite direction of the expectation.

Model 2.2 and Model 2.3 estimation results for; it is seen that the findings are compatible in terms of the coefficients of the covariates in Model 2.2 and 2.3 and Model 2.1.

In this case, the results for both developed and developing countries regarding the relationship between CORR and GDP variable within the scope of Model 1 do not support the "effective lubrication hypothesis" and "making wheels in the sand" hypotheses in the literature. The conclusion that corruption has no statistically significant effect on economic growth supports Drury , Kriekhaus and Luszting (2006), Karagöz and Karagöz (2010) and Assiotis (2012) in the literature . On the other hand, in model 2, which is based on return values, the result for the 2010-2020 period for all countries and developing countries in all periods is that corruption increases economic growth (negative relationship) . This result, Leff (1964), Beck ve Maher (1986), Lien (1986), Bardhan (1997), Dreher and Gasebner (2013), Donk and Torpler (2013), Ondo (2017), Huang (2012) Ho and Huang (2011), Shabbir (2017), Powel et al (2010) and Ali et al (2010) supports. In Model 2 , the statistically significant and positive result of the relationship between CORR and GDP at 10 % and 1% significance level for the 2010-2020 and 2010-2018 periods in developed countries , in particular Mouro (1995), the pioneering study in the literature, and Mo ( 2001), Pellegrini and Gerlagh (2204), Lui (1996), Lambsdorff (1998), Murphy et al (1993) .

## 5. Conclusion and Evaluation

The study is based on the expectation that corruption negatively affects economic growth. This expectation means the expectation that there will be a positive relationship between the corruption perception index (CORR) variable and the gross domestic product (GDP) variable in the econometric analysis part .

As a result of 3 different model analyzes made on level values within the scope of Model 1, there is a negative relationship between the CORR variable and the expected GDP variable. As a result of the analysis in Model 1 , no statistically significant effect was found for all countries, developed countries and developing countries in the whole period and pre- Covid period.

As a result of 3 different model analysis made on return values within the scope of Model 2, there is a negative relationship between the CORR variable and the expected GDP variable. As a result of the analysis in Model 2, it was determined that CORR had a negative effect on GDP for all countries in the period of 2010-2020 and 2010-2018, and this result is opposite to the expectation. The relationship between the two variables was found to be statistically significant and positive at the 10 % and 1% significance level in the developed countries group in the 2010-2020 and 2010-2018 period , which is in the same direction as the expectation. In the developing countries group, the relationship between CORR and GDP is statistically significant and negative for all periods, and this result is opposite to the expectation.

As a result of the analysis conducted within the scope of Model 1, it is seen that the increases/decreases in the political stability index for all periods and the pre-Covid period for all countries and developing countries

correspond to an increase/decrease in the Gross Domestic Product. Unlike the expectation, no statistically significant effect was found in developed countries both in all periods and in the pre- covid period.

The results of the analysis regarding the relationship between PSI and GDP within the scope of Model 2 are in line with the expectation, indicating that the increases/decreases in the political stability index for all periods correspond to the increase/decrease in the Gross Domestic Product for all countries. In developed countries, there was no effect contrary to the expectation in the 2010-2020 period, and a positive effect was found in the same direction as the expectation in the 2010-2018 period. In the developing countries group, the results show that the periodic increases in the Political Stability Index have a positive effect on economic growth in all periods, which is in line with the expectation. When evaluated in general, it is expected that the relationship between the PSI variable and GDP will be positive and statistically significant, and it is seen that the results are in the direction of the expectation.

As a result of the analysis conducted within the scope of Model 1, the relationship between the DI variable and the GDP variable was positive in all periods and in the pre- covid period and for all countries. In other words, increases or decreases in the democracy index affect GDP in the same direction and are in the same direction as the expectation . For developed countries and developing countries, the relationship between the two variables is positive for all periods and the pre- covid period, and is in line with the expectation.

As a result of the analysis on the relationship between the DI variable and GDP within the scope of Model 2, a positive effect in the same direction as the expectation was found for all countries in the 2010-2020 period, and the effect was statistically insignificant in the 2010-2018 period, contrary to the expectation. The results of the analysis for developed countries show that the effect of the DI variable on GDP for the 2010-2020 period is statistically insignificant, while it is concluded that it has a negative effect in the 2010-2018 period, resulting in the opposite of the expectations for both periods. Contrary to expectations, in the developing countries group, no statistically significant effect of DI was found on the GDP variable for both the 2010-2020 and 2010-2018 periods . It is thought that the reason for this result is that the level of democracy in developing countries is already low and there can be no change in this context in the short term, either in the direction of improvement or worsening. As a result of the analysis, it is not surprising that there is a positive relationship between the DI variable and the CORR variable for developed countries, supporting the expectation in all models. The reason for this is that the democracy index is generally high in developed countries. Democracy index is generally higher in developed countries than in developing countries. Even the lowest democracy index value in developed countries is higher than the highest democracy index value in developing countries. In this sense, it is possible to say that the effect of the democracy index on the economy is higher and more effective in developing countries.

In the study, the relationship between corruption and growth was analyzed as the pre-covid period and all periods, covering the data between 2009-2020 for developed and developing countries. Political stability index, democracy index, foreign trade, inflation and foreign direct investments were used as explanatory variables. Considering that public expenditures are an important factor in corruption, it can be done again in a model that will be an explanatory variable in future studies, in a wider period of time and in different country groups.

Policy recommendations developed based on the results of the analysis are given below:

#### **a)Enhancing Transparency and Accountability**

To prevent corruption, transparency and accountability in public administration must be strengthened. Recommended actions include:

- Making public procurement processes more transparent and fully digitalized,
- Strengthening independent auditing mechanisms to monitor public expenditures,
- Adopting open data policies to allow citizens to track government spending.

#### **b) Strengthening the rule of law**

An independent and effective judicial system is crucial in the fight against corruption. Key measures include:

- Implementing reforms to reinforce judicial independence,
- Increasing deterrent penalties for corruption offenses and ensuring their strict enforcement,
- Enhancing cooperation with international organizations specialized in anti-corruption efforts.

**c) Increasing Institutional Capacity**

Strengthening the effectiveness of state institutions plays a critical role in combating corruption. Recommendations include:

- Establishing and strictly enforcing ethical rules for public officials,
- Regularly auditing public officials' asset declarations to prevent bribery and favoritism,
- Strengthening internal audit mechanisms and whistleblower protection systems within public institutions.

**d) Strengthening Anti-Corruption Measures in the Private Sector**

Corruption within the private sector is a major impediment to economic growth. Suggested policies include:

- Encouraging businesses to comply with transparent accounting and financial reporting standards,
- Implementing certification programs that promote ethical business practices,
- Supporting civil society organizations in overseeing corporate accountability.

**e) Expanding Digitalization and E-Government Applications**

Technology is a powerful tool for reducing corruption. Recommended steps include:

- Expanding e-government applications to transition public services to digital platforms,
- Minimizing direct interactions between citizens and public officials to eliminate intermediaries,
- Enhancing digitalization in tax systems to combat the informal economy and tax evasion.

**f) Implementing Cultural and Educational Reforms for Anti-Corruption Efforts**

Long-term corruption prevention requires the strengthening of ethical values in society. Key initiatives include:

- Integrating ethics and transparency education into school curricula,
- Ensuring press freedom so that media can freely investigate and report corruption-related issues,
- Establishing legal frameworks to protect individuals who report corruption.

The above recommendations aim to reduce the negative impact of corruption on economic growth and support sustainable economic development. These recommendations can be developed on a country or region-specific basis.

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