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TANGLED WEBS: EXAMINING THE IMPACT OF ECONOMIC AND POLITICAL FORCES ON CORRUPTION IN DEVELOPING COUNTRIES

Dr. Mehmet Akif Yılmaz
Recep Tayyip Erdoğan University, Faculty of Economics and Administrative Sciences, Department of Economics, Rize, TURKEY.

Abstract

Corruption is a global issue that is known to disproportionately affect developing countries. It has a detrimental impact on resource allocation, government and public policy, and the development of the private sector. To design effective policies to combat corruption, it is essential to identify the factors that influence it. This study aims to contribute to the literature on corruption in developing countries by investigating the economic and political factors that influence it. The study employs a fixed effects model with Driscoll-Kraay standard errors to estimate the impact of economic growth, economic freedom, trade openness, inflation, democracy, and political stability on corruption. The study sample includes 56 developing countries over the period 2002-2012. Results indicate that economic growth, economic freedom, trade openness, democracy, and political stability reduce corruption, while inflation promotes it. The empirical findings draw attention to the numerous economic and political factors that influence corruption in developing countries. Based on the study results, policy recommendations for preventing and reducing corruption, such as establishing stable and high-rate economic growth, implementing policies aimed at combating inflation, conducting policies that enhance economic integration, developing democratic reforms, and ensuring strong government can reduce corruption in developing countries. In summary, the study findings highlight the need for multidimensional policy approaches to combat corruption in developing countries.

Keywords: Developing Countries, Corruption, Economic Growth, Economic Freedom, Trade Openness, Inflation, Democracy, Political Stability, Panel Data Analysis

1. Introduction

Corruption has been recognized as a longstanding issue that has plagued societies throughout history. It has evolved from a regional or national problem to a global phenomenon in recent years, with Transparency International describing it as "the abuse of entrusted power for private gain" and the World Bank defining it as "the abuse of public power for private gain" (Transparency International, 2015; World Bank, 2000). Corruption is widely regarded as a disease that undermines the quality of government and public policies, distorts resource allocation, hinders private sector development, and has negative effects on low-income groups (Glynn et al., 1997; Amundsen, 1999).

The literature has defined corruption in various ways, but the definitions provided by Transparency International and the World Bank are widely accepted. Corruption practices encompass bribery, embezzlement, rent-seeking, extortion, racketeering, lobbying, vote trading, favoritism, and political favoritism (Tanzi, 1998; Aktan, 2001; Lambsdorff, 2006). While corruption has been studied in different disciplines such as sociology, political science, history, public administration,

and criminal law, it was not until the 1980s that economists began to focus on the impact of corruption on economic performance (Abed & Gupta, 2002).

In recent years, there has been an increased interest among economists and policy-makers in the causes and effects of corruption, fueled by a series of corruption scandals that have led to the collapse of governments, loss of trust in politicians and politics, and economic instability in many regions worldwide. Empirical studies have demonstrated a strong relationship between corruption and variables thought to influence it. However, most studies on the causes of corruption have examined developed and developing countries together, and there is a lack of research that focuses exclusively on developing countries (Serra, 2006; Shabbir & Anwar, 2008).

Furthermore, corruption is more prevalent in developing countries, and the factors that influence corruption may vary according to the context of the country being studied. As Olken and Pande (2011) note, identifying the factors that influence corruption in developing countries and providing policy recommendations for its prevention and reduction is crucial.

This study aims to contribute to the literature on corruption by examining the economic and political factors that influence corruption in 56 developing countries over the period 2002-2012. The study employs a fixed effects model with Driscoll-Kraay standard errors to estimate the impact of economic growth, economic freedom, trade openness, and inflation, as well as democracy and political stability, on corruption. The remainder of this paper is structured as follows: Section 2 provides a review of the theoretical and empirical literature on corruption, Section 3 describes the econometric methodology and data, Section 4 presents the empirical findings, and Section 5 concludes with policy recommendations.

In summary, corruption is a pervasive problem that affects societies worldwide, with particularly negative consequences for developing countries. This study seeks to contribute to the literature on corruption by examining the factors that influence corruption in developing countries and providing policy recommendations for its prevention and reduction.

2. Factors Affecting Corruption: Theoreticaland Empirical Literature It is important in efficiently combating corruption to primarily identify the factors that influence it. While there are numerous theoretical studies aimed at this purpose in the literature, the number of empirical studies just started to increase in recent years. However, it is observed that there is not yet any consensus in the empirical literature about the factors influencing corruption due to reasons, such as the differentiation in the used estimation methods, variables and country examples. In this study, which aims to contribute to the discussions in the literature by estimating factors that affect corruption in developing countries; the factors, the influence of which are investigated, are classified into two categories as 'economic factors' and 'political factors". Economic growth, economic freedom, inflation and trade openness constitute the economic factors; while the political factors comprise of democracy and political stability.

2.1. Economic Factors Affecting Corruption When it is regarded that corruption is one of the main characteristics of low and middle-income countries and it is therefore observed more frequently in those, it will be comprehended that there is a close link between corruption and economic growth. Lowness of income level can induce corruption by depraving the work ethics of individuals or organizations since an illegally ensured income increment can make an important influence on the living conditions of individuals. In developing countries where the marginal value

of money is higher in comparison with rich countries, a substantial condition to reduce corruption level is to effectuate structural changes which have the quality to boost the income level. It can be stated in this context that economic growth increases the wages, therefore the living standards of employees; to result a decrease in their efforts to obtain an additional income through illegal ways (Paldam, 2002: 220; Sandholtz and Koetzle: 2000, 36; Bohara et al., 2004: 482).

This theoretical approach expressing that economic growth reduces corruption is supported with numerous empirical findings. Goldsmith (1999), Ades and Di Tella (2000), Sandholtz and Koetzle (2000), Montinola and Jackman (2002), Damania et al. (2004), Brown et al. (2005), Lederman et al.(2005), Brown and Shackman (2007), Rehman and Naveed (2007), Elbahnasawy and Revier (2012) and Bai et al. (2015), found that growth has a statistically significant negative impact on corruption. Moreover, being quite low in quantity, there are also studies in which findings opposite to the above were obtained. Indeed, Frechette (2001) and Braun and Di Tella (2004) reached evidence revealing that economic growth increases corruption.

Another economic factor taken into consideration in studies on the causes of corruption is economic freedom. It is possible to define economic freedom, which has various definitions in the literature, as every individual to possess the right to control and choose their labor and property and the freedom to compete; without any state intervention. In this context, economic freedom entails the creation of a structure by the governments in which contracts can be objectively practiced within a judicial system that protects proprietary rights and it also entails the absence of preventive and restrictive interference (Gwartney and Lawson, 2004a: 5). Indeed, excessive market interventions of preventive quality against free trade, imposed by the governments which possess monopoly power and decision-making authority, via taxes, licenses and various regulations; form a basis for the economic power to concentrate in a small part of the society and hence for the increase of corruption activities (rent-seeking) such as bribery, etc (Tanzi, 1998: 10; Rose-Ackerman, 1999a: 9-20; Goel and Nelson, 2005: 122). When it is taken into consideration that the less restrictions and regulations imposed by the government on economy the more economic freedom there will be, it can be expressed that the increase in economic freedom reduces corruption (Graeff and Mehlkop, 2003: 605; Gerni et al., 2012: 132). While a consensus on the influence of economic freedom on corruption is present in the theoretical literature, it is difficult to speak about a similar unanimity in the empirical literature. Studies conducted by Sandholtz and Koetzle (2000), Abdiweli and Isse (2003), Shen and Williamson (2005), Saha et al. (2009), Ata and Arvas (2011), Gerni et al. (2012), Yakışık and Çetin (2014) and Khandker (2015) set forth evidences that economic freedom does reduce corruption. On the other hand, Swaleheen and Stansel (2007) and Billger and Goel (2009) found that economic freedom does not have a statistically significant influence on corruption. Graeff and Mehlkop (2003), who estimated the influence of each of the subcomponents of economic freedom on corruption separately, identified that some components reduce corruption while others do not have any influence. Similarly, Goel and Nelson (2005) determined that not all components of economic freedom are equally effective in reducing corruption.

It is accepted in theoretical literature that there is a close relationship between corruption and inflation as well. Inflation causes unequal distribution of the national income and the diminishment of the real income level of a large part of the society. Individuals whose real income,

hence the purchasing power decrease due to high inflation may tend towards illegal activities such as fraud, bribery etc. in order to satisfy their needs and procure certain financial advantages (Ata and Arvas, 2011: 164; Paldam, 2002: 222; Braun and Di Tella, 2004: 79). This view, which economically signifies that high inflation increases corruption, is supported by empirical studies conducted on a single country or a group of countries in different periods via different techniques. Getz and Volkema (2001), Bayar (2010), Evrensel (2010), Ata and Arvas (2011), Akça et al. (2012) and Touati (2014) concluded that inflation causes corruption.

The last economic factor examined in this study in terms of its influence on corruption is trade openness. An important indicator of the size of a country's commercial relations with other countries, trade openness is accepted in the theoretical literature as one of the economic factors which influence corruption, just like economic growth, economic freedom and inflation. It is stated in numerous studies on the issue that preventive restrictions on foreign trade do increase corruption. Krueger (1974), for instance, mentions that government restrictions (quantitative restrictions on import) on international economic activities create a rent (monopolistic income) in the many of market-oriented economies, and in order to take advantage of this rent, people; besides legitimate forms of economic activities, also practice rent seeking activities such as blackmarket, bribery, smuggling, etc., which cause welfare loss in the economy. On the other hand, it is reported that trade openness and increasing supply of foreign products on the domestic market enhances domestic competition, thereby reducing rents and corruption (Pellegrini and Gerlah, 2008: 250). In contrast to this view which indicates that trade openness has a reducing effect on corruption, Tanzi (1988) states that trade openness is one of the reasons of corruption. That is to say, with the expansion of foreign trade volume, international companies administer significant amounts of bribe in order to win profitable foreign contracts, to get privileged access to markets or to ensure financial gains such as tax incentives (Tanzi, 1998: 563).

It is observed that the above-mentioned theoretical discussion regarding the influence of trade openness on corruption is also present in the empirical literature. Ades and Tilla (1999), Treisman (2000), Gatti (2004), Sarvar and Pervaiz (2013) and Majeed (2014) found that the increase in trade openness level has a statistically significant negative effect on corruption. On the other hand, Broadman and Recanatini (2000), Knack and Azfar (2003), Pellegrini and Gerlah (2008) explored that no significant correlation exists between those variables; while Bayar (2010) found that trade openness increases corruption, as was stated by Tanzi (1998).

2.2. Political Factors Affecting Corruption

It is observed in theoretical studies in which causes (determinants) of corruption are researched that there exists a general acceptance that corruption is also influenced by a number of political factors besides economic factors. In most of these studies democracy and political stability are examined as political factors. Presence of civil liberties, an efficient and transparent public administration, an operationally efficient judicial system, accountability and fair elections bring along with them the means to disclose and penalize the ones who conduct illegal practices. Therefore politicians who do not want to lose their position and reputation are obliged to work efficiently without using their authorities for private gains (Rose-Ackerman, 1999a: 127). From this point of view, it can be expressed that democracy reduces corruption by detracting the private gains and enhancing the anticipated costs (legal sanctions and loss of reputation) of it. In the meantime,

there actually is a more eligible environment for corruption at nondemocratic societies as their public administration operates under a weak control mechanism (Rose-Ackerman, 1999b: 363). The argument that democracy is a detractive factor on corruption is supported by a multitude of empirical findings. Studies of Akçay (2000), Hill (2003), Güvel and Ata (2011), Tiwari (2012), Kalenborn and Lessman (2013) and Yardımcıoğlu (2013), conducted with the use of panel data that cover different periods and countries are examples. Nevertheless, there are also studies which assert that the effect of democracy on corruption does differ according to the income, democratic development and economic freedom levels in a country. For instance, Jetter et al. (2015), explored that democracy decreases corruption in countries where the income per capita is $2000 or higher, while in poor countries where the income per capita is less than $2000, democracy actually increases corruption. Triesman (2000) who researched the reasons of corruption via crosssection data analysis expressed that corruption is more rarely seen in countries with a long democratic history since the probability that corruption will be disclosed and punished is higher in those. Similar findings were reached at the studies of Mohtadi and Roe (2003), Keefer (2005), Saha (2008), Rock (2009), Campbell and Saha (2013). That is to say, there is a nonlinear relationship, or in other words, a relationship that supports the Kuznets Hypothesis (inverted-U relationship), between democracy and corruption. According to this, as corruption escalates throughout the initial phases of democratization (first stage of the transition from autocracy to democracy); it tends to decrease with the maturation of democracy. Emphasizing the role of economic freedom at democracy-corruption relationship, Paldam (1999), Saha and Gounder (2011), Saha and Su (2012) estimated that democracy exacerbates corruption in countries where economic freedom is absent or low, while it diminishes corruption in countries where economic freedom is at high levels.

Finally in this part of study, the relationship between political stability and corruption is examined. It is possible to define political stability as the political system to be distant to violence, brute force, coercion and destructiveness; lack of any disruption at the political process (Caniklioğlu, 1999: 18); and, in a more general expression, the presence of an efficient and robust political structure. Whether political stability is present in a country is assessed with the quantity of violence and terror incidents such as anti-government demonstrations, political assassinations and executions, major government crises, coups, revolutions, social uprisings, political riots, violent deaths and separatist movements (Abdiweli, 2001: 88). High number of such violence and terror incidents in a country indicates the presence of political instability in that country. Political instability causes disruptions in the areas of economic stability, efficient and fair judicial system, and efficiency of public administration; each of which are among the fundamental tools for the countries in combating corruption. This circumstance weakens the capability of a country's policy and institutional framework to prevent and combat corruption. Indeed, governments which face collapse as an inevitable result of political instability become generally more responsive about ensuring the satisfaction of interest groups. In this sense, incidents that constitute uncertainty across the society create risks for future of public officials and this may induce the operation of corruption practices such as bribery, theft, embezzlement, fraud, etc. (Alesino et al., 1992: 5; Compante et al., 2009: 1). From this point of view, it may be stated that political stability has a considerably important impact on prevention or reduction of corruption and that politically stable countries present lower levels of corruption. This view is verified by a multitude of empirical

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findings. For instance, Tavares (2004), Kotera et al. (2010), MacDonald and Majeed (2011), Akça et al. (2012) and
Churchill (2013) found that political stability reduces corruption. Meanwhile, Serra (2006), Fagbadebo (2007) and Nurudeen et al. (2015) examined the issue in context of political instability and reached evidence that one of the causes of corruption is political instability. Lastly, Elbahnasaway and Revier (2012) determined that political stability does not influence corruption; while Campante (2008) obtained evidence setting forth that political stability, which he defines as the continuity of public officials in their positions, is a factor that enhances corruption.

3. Econometric Methodology and Data

In this study where economic and political factors affecting corruption in developing countries are researched, panel data analysis is used. Panel data analysis presents broader means in comparison with cross-section and time-series analyses at estimation of complex relationships, due to its advantages such as having a higher degree of freedom and the ability to control individual differences among units (Gujarati, 2003: 637-638; Gujarati and Porter, 2009: 592; Baltagi, 2007: 28-30; Baltagi, 2010: 6-8). While these advantages do increase the reliability of the estimation results, this does not mean that panel data analysis does not bear any problems. Indeed since they actually comprise of time-series and crosssection data; problems that can be encountered in these analyses such as autocorrelation, crosssection dependence and heteroscedasticity; each of which may cause bias results, can also be observed in panel data applications (Gujarati and Porter, 2007: 593-612). Therefore, it is necessary to primarily detect if the estimation model contains these problems and if so, to conduct the estimation once again with appropriate techniques. A general panel data model can be shown as the following:

Yit □ □α δitkitXkit □ □... δkitXkit □ηit (1)

i = 1,...,N; t = 1,...T ve k = 1,...,K In model number (1), (i) refers to economic units (countries, companies, households, etc.), in other words the cross-section dimension of the model; (t) refers to the time-series dimension of the model; (N) refers to the number of economic units contained in the model; (T) refers to the number of observations pertaining to each unit; and (K) refers to the number of independent variables in the model. Finally, ηit is the error term of the unit rank number i in the t period. It is considered to be independent for all units and time, and is accepted to display the following distribution: ηit~IN (0, ϭ) (Maddala, 2001: 574; Hill et al., 2011: 540). In panel data approach, the relationships between variables can be investigated through different methods based on the assumptions concerning the characteristics of error terms, constant terms and the slope coefficient in the estimated regression models. The first of these methods is the classic model which assumes that the constant term (α_{it}) that shows the individual effects in the estimation model, and the slope coefficient (δ) are constant for all units and time. In other words, classic model assumes that all observations are homogenous. Classic model is accepted as an efficient estimation method when it is determined that unit and time effects are not present in the model (Greene, 2000: 560; Tatoğlu, 2012: 37-42). On the other hand, since the assumption regarding the absence of unit and time effects does not allow an observation of differences between cross-section units, classic model is not much preferred in panel data analyses. In this case, fixed effects model or random effects model which have different assumptions regarding the effects of unit and time are used.

While it is accepted in the fixed effects model that the slope coefficient is same for all units; in this model, unlike the classic model, it is assumed that the constant term does not vary according to time but does vary from unit to unit (unit effect) or it does vary according to time (time effect) but does not vary between units. From this point on; the model in which the differences in the constant term emerge either only by the unit effect or only by the time effect is called 'one-way fixed effects model'; while the model in which the differences emerge on the basis of both the unit effect and the time effect is called 'two-way fixed effects model' (Hill et al., 2011: 543; Çemrek and Burhan, 2014: 50; Çetin and Ecevit, 2010: 172). Random effects model accepts that the constant term is a random variable. Therefore, this approach considers that the differences between cross-section units emerge randomly. Similarly, assuming that unit and/or time effect(s) are present in the model, the model can be estimated with 'the one-way or the two-way random effects' approach.

Pursuant to the determination of unit and/or time effects, what needs to be done in the second stage is to decide whether these effects are fixed or random (Tatoğlu, 2012: 179). This decision can be made either on the basis of certain assumptions regarding the cross-section (N) and time (T) dimensions of the panel, or by means of the tests developed by Hausman (1978) and Breusch-Pagan (1980). In this study, the appropriate estimator is determined via Hausman test, in which the null hypothesis [H_0: random effects do exist] is tested against the alternative hypothesis [H_1: random effects do not exist]. If the p-value of the calculated Hausman test statistics is greater than 0.05 ($p > 0.05$), the H_0 hypothesis is accepted and the estimation is conducted via random effects model. In the event that the p-value of the test statistics is less than 0.05 ($p < 0.05$), then the H_0 hypothesis is rejected and the relationship between variables is estimated via fixed effects model (Clark and Linzer, 2012:10; Beck, 2004:10). In this study which takes the development classification made by the IMF (International Monetary Fund) as basis; the data belonging to the 2002-2012 period of 56 developing countries (provided in the Annex) is used. It is possible to show the estimation model as the following:

$$\text{Control of Corruption Index}_{it} = \alpha_{it} + \delta_{kit}\text{Economic Factors}_{kit} + \beta_{kit}\text{Political Factors}_{kit} + \eta_{it} \quad (2)$$

In model number (2), "control of corruption index" constitutes the dependent variable of the model. "Economic Factors" and "Political Factors" represent the economic and political variables which are estimated to have an influence on corruption control, and η_{it} represents the error term. In the analysis, the influence of a total of 6 factors on corruption at developing countries is investigated, 4 of them being economic and 2 of them political. The variables (factors) are explained below in detail:

Control of Corruption Index: Acquired from "World Governance Indicators" (WGI) database which has been being produced by the World Bank since 1996. In this database, control of corruption is listed among the characteristics of good governance; along with voice and accountability, political stability, government effectiveness, regulatory quality and the rule of law. Besides assessing the perceptions on the extent of corruption in the country and on the extent to which the public power is used for private gains, the subject index also measures the strength and effectiveness of a country's policy and institutional framework to prevent and combat corruption. An increase in the index value, which ranges between (-2.5) and (2.5), expresses that the country's power to combat corruption has increased and the corruption perception, hence the corruption itself, has decreased.

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3.1. Economic Factors

Economic Growth: Represented with GDP per capita (constant 2005 US $). Data obtained from the "World Development Indicators" (WDI) database of the World Bank are included in the estimation model with their logarithmic values. It is expected that economic growth will reduce corruption.

Economic Freedom: Generated by the Heritage Foundation and The Wall Street with the use of the following ten factors: Freedom from corruption, fiscal freedom, investment freedom, financial freedom, business freedom, monetary freedom, trade freedom, labor freedom, property rights and government spending. An increase in the index, which will take a value in between (0) and (100), expresses the increase of economic freedom level; while the index value to decrease represents the decrease of the same. Meanwhile, since the
"control of corruption index" is specified as a dependent variable in the model, the "freedom from corruption" variable, one of the subcomponents of the economic freedom index, is not taken into consideration as it may influence the results. All data used in the index are obtained from the Heritage Foundation database and used with their pure values. It is expected that economic freedom will contribute the countries to maintain an efficient combat against corruption and will thus reduce it.

Inflation: Inflation variable which is calculated as the annual percentage change at consumer prices -on the basis of 2000 prices-is obtained from the WDI database and used with its pure value. It is expected that inflation will make an increasing effect on corruption.

Trade Openness: Defined as the rate of foreign trade volume (Export+Import) to GDP. Trade openness data obtained from the WDI database are used with their pure values. It is expected that the increase in a country's trade openness rates will generate a decreasing effect on corruption.

3.2. Political Factors

Democracy: Defined as the average of two specific indexes prepared by the Freedom House; the Civil Liberties Index and the Political Rights Index. Civil liberties in the index represent the rule of law and the ability of individuals to possess freedom of voice, freedom of belief, right of organization and personal autonomy; without any government intervention. Political rights are specified as the ability of individuals to vote freely in elections, compete for public office, join political parties and organizations, and elect representatives who are accountable to the electorate. In this index which comprises of values between (1) and (7), (1) represents the most democratic (most free), and (7) the most autocratic (least free) countries. Therefore this index sets forth an inverse relationship between countries' democratic development levels and the index value. An increase in the index value is considered as emergence (or increase) of a set of restrictions in civil liberties and political rights, namely as deterioration of democracy; and a decrease in the index value is considered as an improvement in democracy. It is expected that democratic improvement will create a positive impact on control of corruption. **Political Stability:** The 'Political Stability and Absence of Violence/Terrorism' index, which is accepted by the World Bank as one of the six elements of good governance, is used as the indicator of political stability. The index, which assesses the perceptions on the emergence probability of political instability in countries through violence including terrorism, ranges from (-2.5) to (2.5). An increase in the index value indicates the decrease in political instability probability, in other words, it shows the strengthening of

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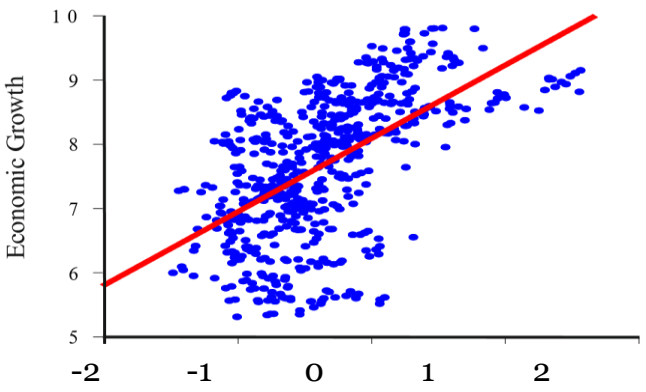
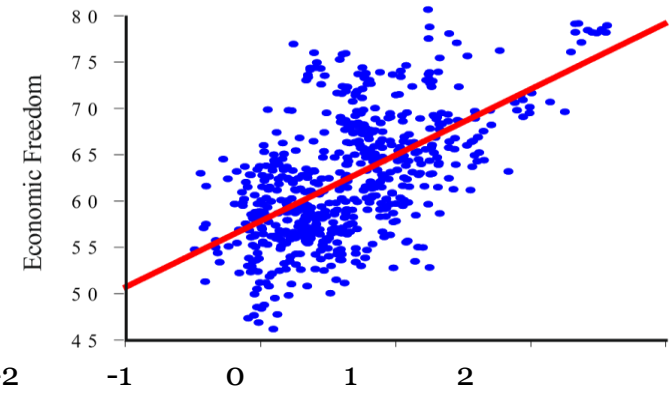
political stability. In the analysis, in which a result suggesting that political stability creates a decreasing effect on corruption is expected, the index data obtained from the WGI database are used with their pure values.

4. Empirical Findings

Prior to proceeding to the econometric analysis, simple statistical tests such as correlation and regression analyses were conducted in order to gain preliminary information on economic and political factors that influence corruption in developing countries. The obtained findings are introduced in the bottom part of the scatter diagrams (Figure 1-2).

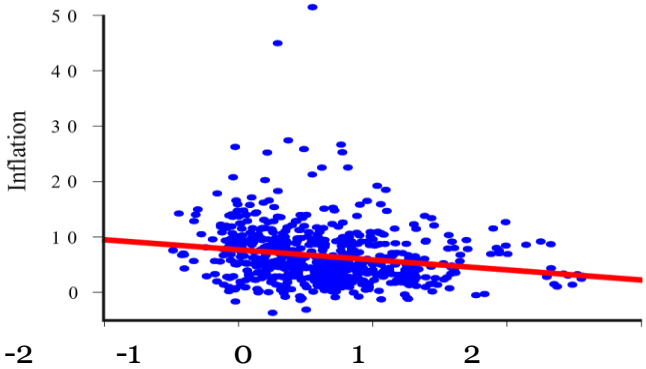
Figure 1. The Relationship between Economic Factors and Control of Corruption

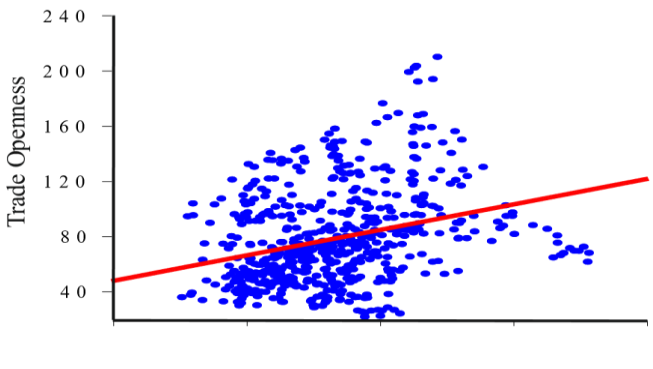




Pearson Correlation = 0. 5700*** Pearson Correlation = 0. 5849***

Control of Corruption = -2.5597 + 0.2863 E. Growth*** Control of Corruption = -3.3716 + 0.0482 E. Freedom***





Pearson Correlation = -0.1902***

Control of Corruption = -0.2333 – 0.0195 Inflation***

-2 -1 0 1 2

Control of Corruption

Pearson Correlation = 0.2950***

Control of Corruption = -0.7336 + 0.0047 Trade Openness***

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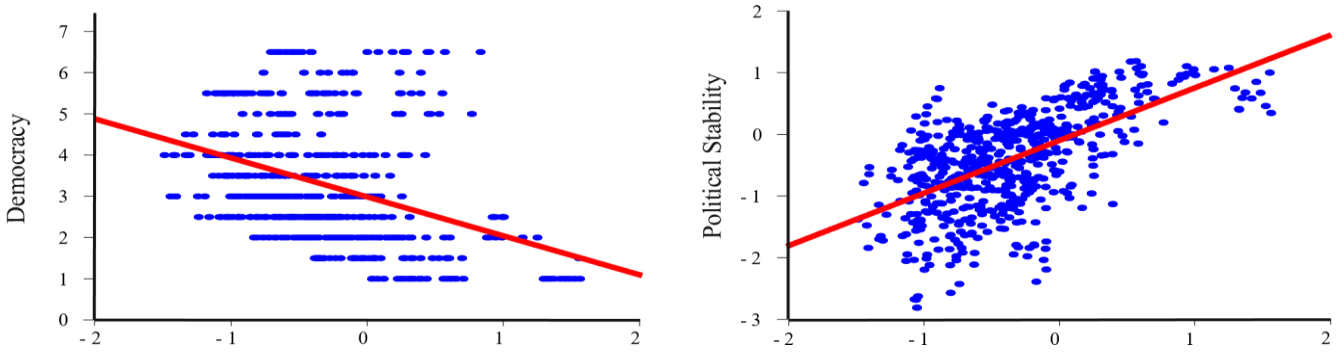
Correlation analysis which is carried out in purpose of obtaining preliminary information regarding the relationship between economic factors and corruption revealed that the control of corruption index has a negative correlation with inflation (-0.19) and a positive correlation with economic growth (0.57), economic freedom (0.58) and trade openness (0.29). These findings indicate that corruption moves in the same direction with inflation but in inverse direction with growth, trade openness and economic freedom. Simple regression test set forth evidence that supported these findings. According to this, a 1% increase in the inflation rate decreases the value of the control of corruption index by 0.019 units (more corruption). On the other hand, a 1% increase in the economic growth and trade openness increase the control of corruption index by 0.286 and 0.004 units respectively (less corruption). Finally, a one-unit increase in the economic freedom index (higher economic freedom) increases the control of corruption index by 0.048 units (less corruption). Although the observations regarding the variables do not exhibit a completely regular distribution around regression lines, it may be expressed that scatter diagrams reveal parallel results to that of correlation and regression tests when the direction of regression lines are viewed (Figure 1).

Figure 2. The Relationship between Political Factors and Control of Corruption



Pearson Correlation = -0. 3495***

Control of Corruption = 0.0744 - 0.1311 Democracy*** Control of Corruption

Pearson Correlation = 0.5979***

Control of Corruption = -0.1885 + 0.4212 Political Stability·

The correlation coefficient which gives the direction and power of the relationship between democracy and control of corruption is 0.34 and with negative sign. This result can be interpreted as the following: A decrease in democracy index value (democratic development) causes an increase in the control of corruption index value, namely it causes a decrease in corruption. This result can also be interpreted in the manner that an increase in the control of corruption index value (less corruption) creates a decrease in democracy index value (democratic development). Similarly, there exists a positive correlation (0.59) between political stability and control of corruption. In conclusion, it can be expressed that correlation findings indicate that democracy and political stability have an inverse relationship with corruption. It is detected with the simple regression test as well that democracy and political stability create a reducing effect on corruption. Concordantly, a one-unit decrease in the democracy index and a one-unit increase in the political stability index increase the control of corruption index by 0.131 and 0.421 units, respectively.

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Finally, as the slope of regression lines are viewed, it is found out that scatter diagrams too support the correlation and regression findings (Figure 2).

Simple statistical tests were followed by the estimation of model number (2). It was first investigated whether a unit and/or time effect is present in the model. The results of LR and F tests conducted for this purpose are given in Table 1. Primarily, LR and F tests were carried out in order to explore whether the two-way model is applicable or not. The LR test set forth that the null hypothesis (H_o: $\sigma_u = \sigma_t = 0$) which asserts the standard errors of unit and time effects are equal to zero is rejected at 1% statistical significance level and that the model contains both unit and time effects. Similarly in the F test, the H_o hypothesis which assumes that unit and time effects are equal to zero was rejected at 1% statistical significance level and it was determined that the two-way model is valid. In the second stage, the presence of unit and time effects were investigated separately. While the LR test revealed the presence of unit effect only, the F test revealed the presence of both unit and time effects in the model. It is determined in light of the obtained results

	LR Test		F Test	
	(χ^2 statistics)	p-value	(F-statistics)	p-value
Unit and Time Effect	805.11***	0.0000	50.67***	0.0000
Unit Effect	803.15***	0.0000	50.22***	0.0000
Time Effect	1.7e-13	1.0000	1.70*	0.0768

that there are two-way effects in model number (2); therefore that the classic model is not applicable for an efficient and reliable estimation.

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Table 1. LR and F Test Results

In LR test; H_o: $\sigma_u = \sigma_t = 0$; In F test; H_o: $\eta_t = \eta_u = 0$

***, and * represent statistical significance at the 1%, and 10% levels, respectively.

After it is found that the classic model is not applicable, it must be clarified whether the explored unit and time effects are fixed or random. In other words, it must be settled if the fixed effects model or the random effects model is more applicable for correctly estimating the relationships between variables. Hausman test was conducted for this purpose, the results of which are shown in Table 2. As can be viewed in the table, Hausman (χ^2) test

statistics have a value of 32.41 and are statistically significant at 1% level (p=0.000). Since the p-value of (χ^2) statistics is less than 0.05; the H_o hypothesis, which accepts that the difference between coefficients is not systematic and the random effects model is therefore applicable, was rejected and it was decided that the fixed effects model will be more efficient in the estimation process.

As mentioned earlier, a correct identification of relationships between the examined variables in the econometric analysis require the estimation models to be free from heteroscedasticity, autocorrelation and crosssection dependence. In order to ascertain whether model number (2) included these problems, relevant diagnostic tests were conducted, the findings of which are presented in Table 3. As a result of the Modified Wald Test which investigated heteroscedasticity, the null hypothesis based on constant variance assumption (H_o: $\sigma_i^2 = \sigma$) was rejected at 1%

significance level to reveal that the model does contain heteroscedasticity. In search of autocorrelation, the Durbin-Watson (DW) test developed by Bhargava, Franzini and Narendranathan (1982) and the Locally Best Invariant (LBI) test suggested by Baltagi-Wu (1999) were used. While critical values are not given for either of the two tests, the calculated test statistics to appear less than 2 is interpreted in the manner that autocorrelation does exist. When examined, it was detected that both of the test statistics of the two tests remain quite below 2, therefore that autocorrelation does exist in the model. Lastly, cross-section dependence was examined via Pesaran CD test and Frees test. Findings of these tests set forth that H_0 hypothesis, which assumes that there exists no relationship between units, was rejected by both tests; therefore it can be said that cross-section dependence does exist as well.

If there is at least one from particular problems such as heteroscedasticity, autocorrelation or cross-section dependence in a panel data model, what needs to be done is either to correct the standard errors without interfering with coefficient estimations or to conduct the estimation on the relationship between variables through appropriate methods (Tatoğlu, 2012: 242). Since the abovementioned problems were faced in panel data model number (2), this model was re-estimated with Driscoll-Kraay standart errors which is a consistent estimator under the assumption that heteroscedasticity, autocorrelation and crosssection dependence do exist. Estimation results of

Table 4. Economic and Political Factors Affecting Corruption in Developing Countries

	Independent Variables	Coefficient	p-value		
Political Factors	Democracy	-0.0618***	0.0072	-8.50	0.000
	Political Stability	0.0394***	0.0130	3.03	0.004
Time Dummy Variables	year_2003	0.0409***	0.0035	11.63	0.000
	year_2004	0.0045	0.0067	0.67	0.505
	year_2005	-0.0078	0.0098	-0.80	0.425
	year_2006	-0.0129	0.0132	-0.98	0.333
	year_2007	-0.0281*	0.0165	-1.71	0.093
	year_2008	-0.0218	0.0157	-1.39	0.170
	year_2009	-0.0520***	0.0170	-3.05	0.004
	year_2010	-0.0600***	0.0198	-3.02	0.004
	year_2011	-0.0784***	0.0219	-3.58	0.001
	year_2012	-0.1053***	0.0247	-4.26	0.000
	Constant Factor	-2.7000***	0.4870	-5.54	0.000

Number of Country Dummy Variables	56
Number of Observations	613
F statistics	1441.91
p-value (F statistics)	0.0000
R2	0.1141

***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

According to the analysis results which indicate economic growth as the strongest economic factor to influence corruption, a 1% increase in economic growth increases the control of corruption index value by 0.287 units. On the basis of this finding, it can be suggested that economic growth increases governments' strength in combating corruption, diminishes the public perception regarding the existence of corruption and therefore creates a decreasing effect on corruption. Indeed, in societies which acquire increases in income level and welfare levels through economic growth, it is expected in principle that individuals or groups do not engage in illegal activities towards maximizing their interests. In this regard, it can be expressed that a stable and high-rate growth is one of the fundamental elements of anticorruption strategy in developing countries.

Economic freedom is another factor which is identified to have an influence on corruption in developing countries. In this respect, a one-unit increase in the economic freedom index increases the control of corruption index value by 0.004 units. This finding, which signifies that economic freedom creates a decreasing effect on corruption, strongly supports the assumption of Gwartney and Lawson (2004b), which state that "corruption is low in economically free countries and high in countries where economic freedom is limited". Therefore it can be set forth that an increase in economic freedom level in developing countries has an efficient role in combating corruption.

As expected, inflation rate variable has negative sign and it is statistically significant at 5% level. This result, which shows that a 1% increase in inflation rate reduces the corruption control index value by 0.004 units and therefore signifies that inflation increases corruption, verifies the following theoretical remark: "High inflation is a phenomenon which forms a basis for the income loss of individuals or groups (especially the ones with fixed income) and disruption in income distribution in the society. This situation leads people who experience income loss to tend towards illegal and suspicious activities."

Fixed effects results revealed that the coefficient of trade openness is positive and statistically significant at 1% level. That means, trade openness has positive effect on control of corruption. With this regard, a 1% increase in trade openness leads to an increase in the control of corruption index by 0.001 units. Economically, this result can be interpreted that corruption is lower in countries where trade openness is high and higher in countries where restrictions on international trade activities are intense. In this context, it is possible to state that trade openness creates a diminishing effect on corruption in developing countries.

Panel data results show that there is a statistically significance negative correlation between corruption and democracy. According to this, a one-unit decrease in democracy index (development of democracy) increases the control of corruption index by 0.061 units (less corruption). These results can be interpreted in the manner that the development of democracy, which is defined as a political system where political rights and civil liberties are broad, public administration is efficient and transparent, individuals are free and able to call the administrators to account via fair elections, plays an effective role in countries' combat against corruption. Similarly, as expected, political stability has a decreasing effect on corruption in developing countries. Indeed, a one-unit increase in political stability index increases the control of corruption

index value by 0.039 units. It can be mentioned in this context that political stability enhances the skills of a country's policy and institutional framework on preventing and combating corruption.

5. Conclusion and Recommendations The purpose of this study is to identify the economic and political factors that influence corruption. In this regard, panel data approach was used in the study for 56 developing countries in the 2002-2012 period. Empirical findings set forth that all factors that were included in the estimation model do influence corruption in accordance with the theoretical assumptions and expectations. In this scope, as economic growth, economic freedom and trade openness facilitate the control of corruption and hence make a decreasing effect, inflation on the contrary is a factor that increases corruption. In addition, it was found that democracy and political stability are the political factors that also have a reducing effect on corruption level in those countries. The detection that corruption is influenced by several economic and political factors point out that the combat against corruption has to be multidimensional. On the basis of these views and findings, a set of policy suggestions regarding efficient combat against corruption in developing countries are listed below: • It is rather important to establish a stable and high-rate economic growth. Indeed, individuals having higher incomes will have lower inclination towards illegal practices. What needs to be emphasized here is that this growth has to be in a character that reduces the unequal income distribution in the society. Unless the increase in welfare that is achieved with growth is dispersed throughout the base of the society, economic growth may not only fail to be an effective tool in combat against corruption but it may also be a cause for the increase of corruption. • Interventions that are restrictive upon economic freedom level such as taxes, regulations, licenses, controls, quantitative restrictions should not be applied excessively. Instead of those, liberal economic policies which enhance competition and freedoms should be conducted.

- It is important that policies on combating inflation are effectuated.
- As mentioned by Krueger (1974), strict public applications that are restrictive on foreign trade increase rent-seeking activities, which cause welfare loss in the economy. Therefore policy makers should implement foreign trade policies which are oriented towards enhancing economic integration
- Reforms aimed at developing democracyshould be put into effect. For instance, transparency and accountability should be ensured in public administration. Civil liberties and political rights should be broadened and the rule of law should be rendered sovereign. Improvements in these areas which constitute the basic principles of advanced democracy will contribute to the decrease of corruption.
- It is well known that corruption is particularly higher in times of uncertainty, namely in periods of political instability. In this regard, it should not be overlooked that prior to everything else, strong governments are necessary for an effective combat against corruption.

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