# DETERMINANTS OF ECONOMIC CORRUPTION: A CROSS-COUNTRY DATA ANALYSIS

**A.Yılmaz ATA**
Associate Professor
Depaetment of Economics, Gaziantep University
G.Antep-Turkey
E-mail: ayata@gantep.edu.tr, +90 0342-317208

**Dr. M. Akif ARVAS**
Depaetment of Economics, Hacettepe University
Ankara-Turkey
E-mail: aarvas@hacettepe.edu.tr, Phone: +90 0312 2978650

## Abstract

*Corruption, which is described as the use of public power for individual purposes is a complex concept. Since corruption's roots are grounded in a country's economic, political, legal, social and cultural structure, it threatens security, damages trust and public confidence in systems which affect people's daily lives. The aim of this paper is to empirically test a model that links economic factors such as economic development and growth, inflation, economic freedom and income distribution to corruption in a cross-section of 25 Europe countries in the average of 2004-2007 years. The empirical findings of this paper suggest that economic development, inflation, economic freedom and income distribution are found statistically significant determinants of corruption. In this respect, in periods of economic booming as GDP per capita rises, corruption declines. On the contrary in periods of high inflation and skew income distribution, corruption rises. However, in this study, economic growth is found statistically insignificant determinant of corruption.*

**Key Words:** Corruption, Economic factors, Cross-section analysis

**JEL Codes**: D02, D40, D72, D73, D82

## *1.Introduction*

Corruption that can be generally defined as the use of public power for individual interest is a universal, complex and multifaceted concept (Aidt, 2003, p. 632). It can take many forms. Public office can be misused by bribery, embezzlement, extortion, fraud, nepotism, patronage, theft of state assets and insider trading. This phenomenon has been seen either as a structural problem of politics or economics, or as a cultural and individual moral problem (Andving, Fjeldstad, Amundsen, Sissener and Soreide, 2000, 9; Luo, 2004, p.121). Corruption is an extremely complex social behaviour. Because it has a feature that combines the various social science in a joint research center, there have been many notable scholary studies on the corruption (Collier, 2002, p.2). With this direction almost in every branch of social disciplines in terms of his own corruption issues discussed were receiwed and reviewed. Many methods could be employed in analysing corruption. Perspectives from political science, psychology, sociology, economic, law and anthropology all provide important insights for analysis (Tekgöz, 2002, p. 8).

Until the 1980s, studies on corruption was largely confined to the fields of sociology, political science, history, public administration, and criminal law. Since then, economists have also turned their interest to this topic, largely on account of its increasingly evident link to economic performance. Since the early 1990s, there has been a virtual explosion of academic writing on the economics of corruption. Because the construction of indicators of corruption that could be used in empirical studies (Abed and Gupta, 2002, p.3). Since 1990's, owing to a great deal of empirical work done on corruption and to the new developments in measurement technics, the literature about economic analysis of corruption has notabily been arisen. While economic analysis of corruption has inclined to detect the economic consequences of corruption, on the other hand, these studies have intended to reveal the economic causes of corruption. There is a multidimensional picture to illustrating economic causes of corruption (Adaman, Çarkoğlu and Şenalatar, 2001, p. 8). First, economic development or growth is determined as the preliminary factors that are the economic causes of corruption. Second besides this basic factor, there are numerous economic factors affect corruption. In the literature, government regulations, government's role in economy, the size of the unregistered economy, public sector recruitment and wages, poverty and inequality in income distribution, trade openness, inflation, tax system, economy's competitiveness and economic freedom are extensively mentioned among others as the potential economic factors that affect corruption.
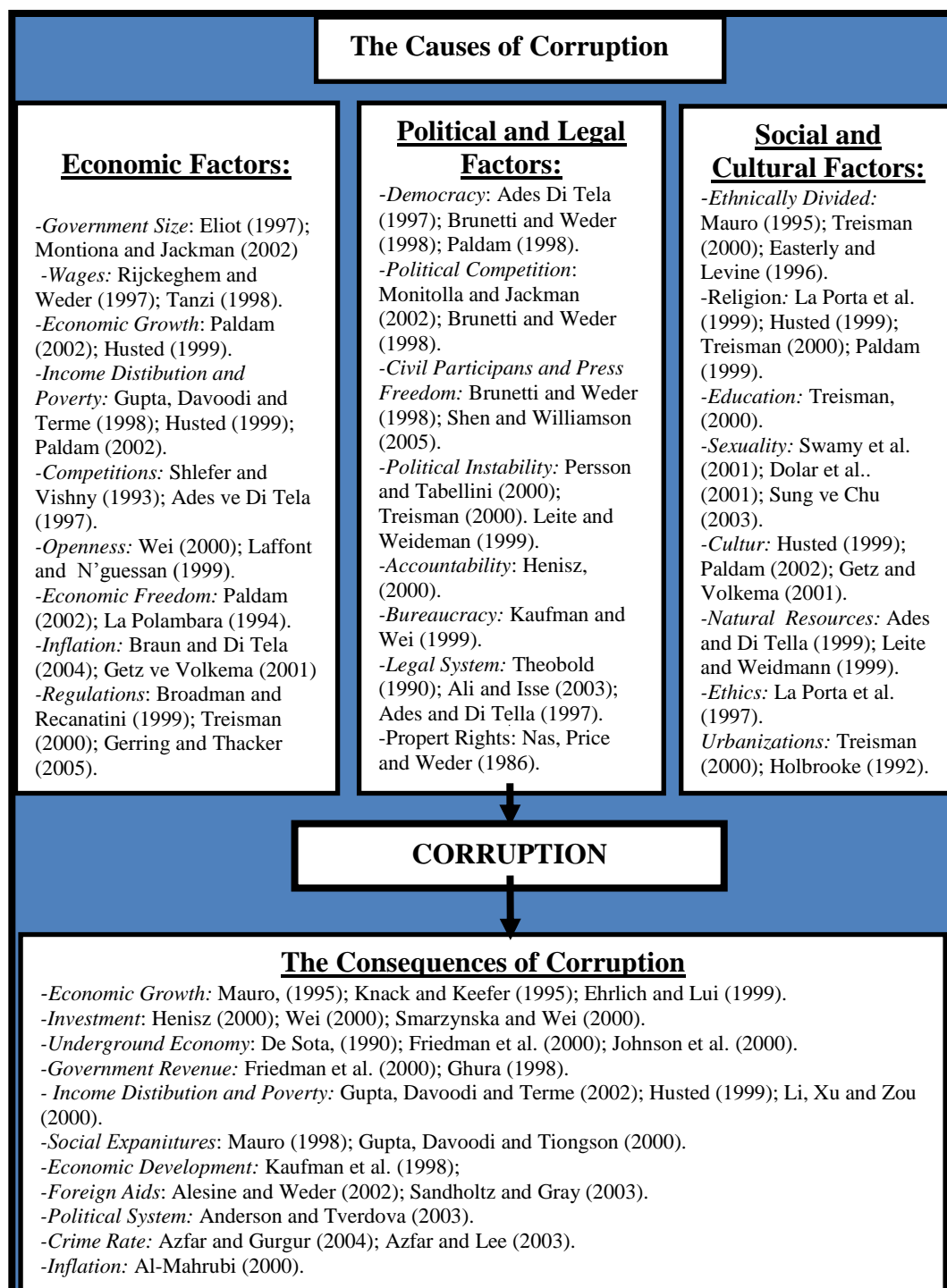
This study aims to identify the main causes of corruption particularly within economic factors. Hence, the method of this paper is to empirically test a model that links economic factors such as economic development and growth, inflation, economic freedom and income distribution to corruption in a cross-section data on 25 members of EU in the average of 2004-2007 years. Maximum likehood method is used in estimating the coefficients of the regression model. As a priority for this aim, theoretical knowledge is explained on economic causes of corruption. Then, the hypothesis of a set of theoretical knowledge are created within the framework of this assumption and tested with econometric model. The study is based on theoretical framework of Paldam (2002). However it differs from Paldam's study on two aspects. First, Paldam's cross-country regressions covers only the year of 1999 whereas this study covers the periods of 2004-2007. Second, this study covers EU'countries whereas Paldam's study just covers under developed countries.

## 2. Literature Review

"*What are the factors leading to corruption?*" is the fundamental question of studies on corruption. Studies trying to determine the causes of corruption, generally underline the socio-economic, political, judiciary and cultural aspects of a country. Therefore, corruption should be considered as a social deviation instead of defining it as an individualistic action. The assumption explaining that the human behaviour is caused by the sophisticated relations among social, political, economic and cultural structures supports this argument. Because of this assumption, it is convenient to say that corruptional behaviour of individuals depends on some circumstances that do not only include economic factors but also cover political, judiciary, social and cultural elements. In the literature, empirical research on the causes of corruption focuses on political institutions, government regulations, legal systems, GDP-levels, public sector wages, trade openness, gender, education, religion, ethno-linguistic diversity and other cultural dimension, poverty, as well as the role of colonialism (Andving et al., 2000, p.79).

By some authors, the causes of corruption are determined as follows: The *impact of national wealth* (Husted 1999, Mauro 1995, Paldam 1999-2002, Lambsdorff 1999, Montinola and Jackman 2002, Treisman 2002), the *size of government* (Elliot 1997, LaPalombara 1994, Montinola and Jackman 2002), *democracy* (Amudsen 1999, Lipset and Salman Lenz 2000, Sung 2004, Treisman 2000, Paldam 1998, Ades Di Tella 1997, Brunetti and Weder 1998, Haris-White and White 1996, Goldsmith 1999), *income distribution and poverty* (Gupta, Davoodi and Terme 1998, Husted 1999, Paldam 2002, You and Khagram 2004, Shen and Williamson 2005), *public sector recruitmen and wages* (Rijckeghem and Weder 1997, Treisman 2000, Rauch and Evans 2000, Tanzi 1998, La Porta et al. 1998), *trade openness* (Wei 2000, Broadman and Recanatini 2000, Laffont and N'guessan 1999), *inflation* (Braun and Di Tella 2004, Paldam 2002, Al-Marhubi 2000, Getz and Volkema 2001), *economic freedom* (Paldam 2002, La Polambara 1994, Goel and Nelson, 2005), *political stability* (Leite and Weidman 1999, Treisman 2000, Persson and Tabellini 2000), *ethno-linguistic diversity* (Mauro 1995, Treisman 2000, Easterly and Levine 1996), *government regulations* (Broadman and Recanatini 1999, Gerring and Thacker 2005), *gender* (Swamy et al. 2001, Dolar et al. 2001, Sung and Chu 2003), *economy's competitiveness* (Shlefer and Vishny 1993, Ades and Di Tella 1997).

These studies have shown that corruption is a multi-dimensional and complicated concept. According to the estimated results of these studies, not only economic factors such as economic development, economic freedom, inflation and distribution of income etc. but also political, social and cultural factors such as democracy, political stability, gender and ethno-linguistic diversity have important effects on corruption. the literature on the causes and effects of corruption, some of the existing studies are shown in table 1.

**Table:1. The Causes and Consequences of Corruption**

**The Causes of Corruption**

**Economic Factors:**

-*Government Size*: Eliot (1997); Montiona and Jackman (2002)
-*Wages:* Rijckeghem and Weder (1997); Tanzi (1998).
-*Economic Growth*: Paldam (2002); Husted (1999).
-*Income Distribution and Poverty:* Gupta, Davoodi and Terme (1998); Husted (1999); Paldam (2002).
-*Competitions:* Shlefer and Vishny (1993); Ades ve Di Tela (1997).
-*Openness:* Wei (2000); Laffont and N'guessan (1999).
-*Economic Freedom:* Paldam (2002); La Polambara (1994).
-*Inflation:* Braun and Di Tela (2004); Getz ve Volkema (2001)
-*Regulations*: Broadman and Recanatini (1999); Treisman (2000); Gerring and Thacker (2005).

**Political and Legal Factors:**

-*Democracy*: Ades Di Tela (1997); Brunetti and Weder (1998); Paldam (1998).
-*Political Competition*: Monitolla and Jackman (2002); Brunetti and Weder (1998).
-*Civil Participans and Press Freedom:* Brunetti and Weder (1998); Shen and Williamson (2005).
-*Political Instability:* Persson and Tabellini (2000); Treisman (2000). Leite and Weideman (1999).
-*Accountability*: Henisz, (2000).
-*Bureaucracy:* Kaufman and Wei (1999).
-*Legal System:* Theobold (1990); Ali and Isse (2003); Ades and Di Tella (1997).
-Propert Rights: Nas, Price and Weder (1986).

**Social and Cultural Factors:**

-*Ethnically Divided:* Mauro (1995); Treisman (2000); Easterly and Levine (1996).
-*Religion:* La Porta et al. (1999); Husted (1999); Treisman (2000); Paldam (1999).
-*Education:* Treisman, (2000).
-*Sexuality:* Swamy et al. (2001); Dolar et al.. (2001); Sung ve Chu (2003).
-*Cultur:* Husted (1999); Paldam (2002); Getz and Volkema (2001).
-*Natural Resources:* Ades and Di Tella (1999); Leite and Weidmann (1999).
-*Ethics:* La Porta et al. (1997).
*Urbanizations:* Treisman (2000); Holbrooke (1992).

**CORRUPTION**

**The Consequences of Corruption**
-*Economic Growth:* Mauro, (1995); Knack and Keefer (1995); Ehrlich and Lui (1999).
-*Investment*: Henisz (2000); Wei (2000); Smarzynska and Wei (2000).
-*Underground Economy*: De Sota, (1990); Friedman et al. (2000); Johnson et al. (2000).
-*Government Revenue:* Friedman et al. (2000); Ghura (1998).
- *Income Distibution and Poverty:* Gupta, Davoodi and Terme (2002); Husted (1999); Li, Xu and Zou (2000).
-*Social Expaniitures*: Mauro (1998); Gupta, Davoodi and Tiongson (2000).
-*Economic Development:* Kaufman et al. (1998);
-*Foreign Aids*: Alesine and Weder (2002); Sandholtz and Gray (2003).
-*Political System:* Anderson and Tverdova (2003).
-*Crime Rate:* Azfar and Gurgur (2004); Azfar and Lee (2003).
-*Inflation:* Al-Mahrubi (2000).

## 3. Theoretical Framework

The search for the roots of corruption has led theorists to consider a broad layout of economic, political, cultural and pyschological factors (Husted, 1999, p.339). The roots of corruption are as multiple and complex as its forms are varied (Mills, 2001, p.6). However in this paper, only the role of economic growth and development, income inequality, inflation and economic freedom are discussed and analyzed.

### 3.1. Economic Growth and Development

In the fundamental part of theoretical arguments, it is assumed that there is a relationship between the level of economic growth or economic development and the level of corruption (Husted, 1999, p.340; Tekgöz, 2002, p.116). Lack of economic resources can emerge as a fundamental factor leads to corruption. Corruption is a phenomenon that existing in all countries. However it can emerge more rapidly in low-income countries than in high- income countries. In high-income countries, some countervailing dynamics prevent the outspread of corruption: (a) secular increase in wages, educations and urbanization,

(b) improvements in transportation and communications technologies, (c) the growth of mass media, (d) improvements in managerial and accounting skills, (e) the rise of capitalist class, urban middle class and urban labor force, (f) the increasing pressure on government expenditures (Alam, 1995, p. 430; Mynit, 2000, p. 52-53). Since each of these factors is higly correlated with the level of economic development and growth of a country, we focus only on the relationship between economic growth or development and corruption (Husted, 1999, p.342). Thus hypothesis are set as follows:

*Hypothesis 1: The higher the level of economic development, the lower will be the level of corruption in a country.*
*Hypothesis 1[*]: The higher the level of economic growth, the lower will be the level of corruption in a country.*

## 3.2. Income Distribution

Income inequality is used as an explanatory variable for corruption. Scott (1972) argued that with a more equal income distribution, a relatively large middle class will exist that can act to hold elites accountable and, as a consequence, result in lower levels of corruption (Husted, 1999, p.342). Whereas in a country that the levels of inequality is high, the relatively small number of wealthy people will have greater motivation and opportunities to use bribery and fraud to preserve and advance their status, privileges and interest as a class, firms and individuals (You and Khagram, 2004, p. 8). Finally, in the economy, corruption such as rent seeking and bribery will spread like a culture of corruption in the economy. In addition, a inequality in the distribution of income and poverty may increase the temptation to make illegal gains (Paldam, 2002, p. 224). As people with low-income, in order to sustain their lives, try to gain an illegal income, corruption will be spreaded in the economy Shen and Williamson, 2005, p. 330). From these arguments, we derive the following hypothesis:
*Hypothesis 2: The higher the inequality in the distribution of income, the higher will be the level of corruption in a country.*

## 3.3. Inflation

One of the factors causing corruption is inflation. Since inflation reduces the level of real wages, it negatively affects the purchasing power of people. Although the purchasing power decreases, the basic needs must be met first. If not, people might apply to any kind of illegal methods such as fraud, bribery, embezzlement for needs. Therefore, these socio-economic deteriorations lead the level of corruption to increase in a country. A lot of people believe that inflation can be caused to "moral hazard" (Paldam, 2002, p. 221). And then it can offer opportunity for illegal and unethical behaviour such as fraud, deception, embezzlement. Moreover, any informational problems caused by inflation can lead to more corruption. Because, high and variable inflation is assumed to increase uncertainty about prices and therefore cost of accounting the agent's behaviour (Braun and Di Tella, 2004, p. 79-80).

Inflation can be affected by the level of corruption indirectly. High and variable inflation can be reduced by the level of investment and economic growth. So, the decreasing level of investment and economic growth can be also negatively affected by the level of corruption (Braun and Di Tella, 2004, p. 80). Likewise, the inequality in the distribution of income can be increased by inflation. This has led to the expansion of corruption (Paldam, 2002, p. 222). Therefore, we propose the following hypothesis:
*Hypothesis 3: The higher and more variable inflation in a country, the higher will be the level of corruption.*

## 3.4. Economic Freedom

Economic freedom is "the absence of government compulsion or constraint on the production, distribution or consumption of goods and services" (Chafuen and Guzman, 2000, p. 52). Simply, economic fredom is inherently connected to the level of government activity in an economy. Corruption is generally connected with the activities of the government and especially with the monopoly and discretionary power of the government. Therefore, the larger the government and the greater the extent of government intervention in the economy, the greater will be the fertile conditions in the economy (Tanzi, 1998, p. 566). The fewer resources including assets and regulatory power a government controls, the fewer will be the opportunities for corruption. Both the number and amount of resources controlled by a government and the ability of its officials to grant privileges can influence the level of corruption (Chafuen and Guzman, 2000, p. 59; Goel and Nelson, 2005, p.117). Economic freedom is decreased when taxes, government restriction and regulations are replaced for personal choice, voluntary exchanges and market coordination. Government intervention such as regulations and licences creates large bureaucracies and rises the occurrence of corruption (Shen and Williamson, 2005, p. 331; Ogus, 2004, p. 331). As a result, while the general belief is that greater economy as well as economic freedom reduces corruption (Goel and Nelson, 2005, p. 117). We thus hypothesize that:
*Hypothesis 4: The higher the level of economic freedom, the lower will be the level of corruption in a country.*

Finally, the most recent and relevant empirical contributions on the corruption's determinants are summarized in table 2. As shown in table 2, this paper's assumptions and hypothesis are supported by these studies and finding.

**Table 2. Main Empirical Studies on Determinants of Corruption and its Finding**

|  | Treisman (2000) | Paldam (2002) | Husted (1999) | Serra (2004) | Braun and Di Tella (2000 | *Persson, Tabellini and Trebbi (2001)* | Lederman, Loayza and Soares (2005) | Rijckeghem and Weder (1997) | You and Khagr-am (2004) |
|---|---|---|---|---|---|---|---|---|---|
| COR | CPI, BI | CPI | CPI | CPI, GRAFT** | ICRG | CPI | ICRG | ICRG | CPI |
| GDPPC | + | + | + | + | + | + | + | $\varnothing^*$ | + |
| GRWTH |  | + |  |  |  |  |  |  |  |
| INF |  | - |  |  | - |  |  |  |  |
| EF | + | + |  | + |  |  |  |  |  |
| GINI |  | - | $\varnothing$ |  |  |  |  |  | - |

*\* statistically insignificant*
**\*\* Corruption index from Kaufman, Kraay and Zoido-Lobaton (1999**

## 4. Methodology, Data and Model

This paper aims to answer to the question of what are the economic factors that may cause corruption. To answer the question, an empirical study is pursued by using a cross-section data including corruption, economic development, growth, inflation, economic freedom and income distribution on 25 members of EU in the average of 2004-2007 years. Maximum likehood method is chosen in estimating coefficients of regression model. A list of 25 members of EU is presented in appendix 1.

In this study, the econometric model to be estimated is as follows:

$$CPI = c + \alpha_1 GDP + \alpha_2 G + \alpha_3 I + \alpha_4 EF + \alpha_5 GINI + \varepsilon \qquad (1)$$

where CPI is a corruption perception index; GDP stands for *GDP* per capita; G is the growth rate of gross domestic product; I is the inflation rate; EF is a economic freedom index; GINI is a Gini coefficient; c is a constant and $\varepsilon$ is the error term. This study differs from others on some aspects. First, while the other studies have preferred to use the method of simple OLS estimation, in this study the Tobit model of censored regression models is employed to estimate the equation (1) using cross section data on the variables included in the model. Since the dependent variable, corruption index, has a certain points (from 0 to 10), OLS method is inconsistent and biased in estimating the regression models (Gujarati, 1999, p. 572; Kennedy, 2006, p. 309; Wooldridge, 2001, p. 517). Therefore, "Censored Regression Model" is used instead of OLS.

The dependent variable of this study is Transparency International's (TI) annual index of "*Corruption Perception Index* (CPI)" for the average of 2004-2007. Another independent variables of this study are *Gross Domestic Product (GDP)* per capita in purchasing power standards, *Growth Rate of Gross Domestic Product* (G) is calculated as volume-percantage change on previous year, *Inflation rate* (I); annual average rate of change in harmonized induces of consumer prices. These indicators were extracted from the European Union's Statitics Arm (EUROSTAT). For *economic freedom* (EF) data are taken from the Fraser Institute's economic freedom indexs. To get inequality of income distribution in this study *Gini coefficient (GINI)* from World Bank Data file is used. All remaining variables are averaged over the period of 2004-2007 years. The information about explanatory variables are given in appendix 2. The explanatory variables and their expected signs are indicated in table 3.

**Table 3. Explanatory Variables and Their Expected Signs**

| *The symbols of Explanatory Variables* | *Explanatory Variables* | *The Sources of Explanatory Variables* | *Expected Signsi* |
|---|---|---|---|
| CPI | Corruption Perception Index | Transparency International |  |
| GDP | Gross Domestic Product per capita | EUROSTAT | + |
| G | Growth rate of Gross Domestic Product | EUROSTAT | +, - |
| I | *Inflation rate* | EUROSTAT | - |
| EF | Economic Freedom Index | Fraser Institute | + |
| GINI | *Gini Coefficient* | World Bank | - |

## 5. Empirical Results

The method of censored regression model by using maximum likehood is employed to estimate equation 1. The regression results are reported in table 4. Since the F-statistics related to equation 1 is statistically significant at the 5% significance level, the model's goodness of fit is significant. According to the results, all of the coefficients have the expected signs and except constant term and growth variable, all of the explanatory variables are statistically significant at the 5% and 10% significance level, accordingly.

**Table 4. Estimation Results of Regression Analysis**

| *Variables* | *Coefficient* | *t-statistic*[Ψ] | Prob. |
|---|---|---|---|
| Constant | -2,6254 | -0,7647 | 0,4444 |
| GDP | 0,0361 | 3,2629 | 0,0011* |
| Growth | 0,0160 | 0,1394 | 0,8891 |
| Inflation | -0,2177 | -1,9330 | 0,0532** |
| Economic Freedom | 1,3416 | 2,9176 | 0,0035* |
| **GINI** | -0,1080 | -2,0837 | 0,0372* |

**\*;** denotes significance at the 5% level.
**\*\*;** denotes significance at the 10% level.
**[Ψ];** t-statistic is corrected using heteroskedasticity-consistent Robust Huber/White Standard Errors[1]
**F=** 27,18 ; **p-value**= 0,0000

The empirical results show that, *Gross Domestic Product per capita (GDP)* has the positive sign and statistically significant at the 5% level in the regression. The point estimate suggests that a 1 point increase in the GDP, rises (less corruption) corruption index by 0,0361 points. The *inflation rate (I)* has the negative sign and statistically significant at the 10% level in the regression. According to estimates a 1 point increase in the inflation rate decreases (more corruption) corruption index by -0,2177 points. *The economic freedom (EF)* has the positive sign and statistically significant at the 5% level in the regression. According to estimates a one point increase in the economic freedom index increases (less corruption) corruption index by 1,3416 points. *Gini coefficient (GINI)* has the negative sign and statistically significant at the 5% level in the regression. The point estimate suggests that a one point increase in the GINI decreases (more corruption) corruption index by -0,1080 points. *Growth Rate(G)* has also expected (positive) sign, even though not statistically significant at the 5% level or at the 10% in the regression. Moreover, the relationship between dependent variable (corruption) and independent variables (GDP, Growth, Inflation, Economic Freedom and GINI) is shown in Appendix 3.

## 6. Conclusion

All economic agents are maximizing their individual utility or welfare. Accordingly, selfish interests of economic agents are the basic motive for economic transactions among them. If the public power is misused for individual interest by officials, then there will be corruption phenomenon in the economy. This phenomenon is an important economic and social problem. The first vital step for evaluating issue of corruption is to analysis to the aspects of corruption environment and properties to determine the factors causing corruption.

"What are the factors leading corruption?" is the fundamental question of studies related to corruption. The studies on causes of corruption underline generally economic, political, judiciary, psychology and cultural sides of social structure. However, this paper aimed to explain the causes of corruption just by economic factors.

According to this view, it is tried to obtain the answer to the question of what are the economic factors that may cause corruption. For answering to the question an empirical study is pursued by using a cross-section data on 25 members of EU. The empirical findings of this paper suggest that economic development, inflation, economic freedom and income distribution were found to be statistically significant determinants of corruption. In this respect; economic transition from poor countries to rich countries reduces corruption. In periods of high economic freedom (high index value), corruption decreases. But in periods of high inflation and skew income distribution, corruption increases. However, in this study, economic growth is found statistically insignificant determinant of corruption.

---

[1] Robust Huber/White Standart Error approach is the most widespread and preferred among the "Heteroskedasticity-Robust Standart Error Approach". For details seez. Wooldridge, J. M. (2001); Econometric Analysis of Cross Section and Panel Data, The MIT Pres, Cambridge, Massachusetts London, England, pp. 55-58.

**Appendix 1. Country List: 25 Member Countries of EU and EU Accession Date[2]**

| Country Name | The Date of Beginning the Members of EU | Country Name | The Date of Beginning the Members of EU |
|---|---|---|---|
| *Germany* | *1957* | Portugal | *1986* |
| *Austria* | *1957* | Luxemburg | *1957* |
| *Belgium* | *1957* | Czech Republic | *2004* |
| *United Kingdom* | *1973* | Estonia | *2004* |
| *Denmark* | *1973* | Hungary | *2004* |
| *Finland* | *1995* | Lithuania | *2004* |
| *France* | *1957* | Malta | *2004* |
| *Netherlands* | *1957* | Slovakia | *2004* |
| *Ireland* | *1973* | Cyprus | *2004* |
| *Spain* | *1985* | Latvia | *2004* |
| *Sweden* | *1995* | Poland | *2004* |
| *Italy* | *1957* | Slovenia | *2004* |
| **Greece** | *1995* | | |

**Appendix 2. Description of the Data**

*Dependent Variable*

**CPI:** Proxy for corruption level published by Transparancy International since 1995. Transparancy International, which is a non-governmental organization based in Berlin, publishes annually the Corruption Perception Index (CPI) of countries. This index is a "poll of polls", indicating impressions of businessmenn, local population of relevant countries and risk analysts who have been surveyed. The index is a continuous scale from 0 to 10. A score of 10 represents a completely clean country, and 0 represents an absolutely corrupt state.

*Independent Variables*

**GDP:** Gross domestic product (GDP) is a measure for the whole economic activity. It is defined as the total market value of all final goods and services produced in a country in a given year, equal to total consumer, investment and government spending, plus the value of exports, minus the value of imports. The volume index of GDP per capita in Purchasing Power Standards (PPS) is expressed in relation to the European Union (EU-27) average set to equal 100. If the index of a country is higher than 100, this country's level of GDP per capita is higher than the EU average and vice versa. Basic figures are expressed in PPS, i.e. a common currency that eliminates the differences in price levels between countries allowing meaningful volume comparisons of GDP between countries. Please note that the index, calculated from PPS figures and expressed with respect to EU27 = 100, is intended for cross-country comparisons rather than for temporal comparisons.

**Growth:** Calculation of the annual growth rate of GDP volume is intended to allow comparisons of the dynamics of economic development both over time and between economies of different sizes. For measuring the growth rate of GDP in terms of volumes, the GDP at current prices are valued in the prices of the previous year and thus computed volume changes are imposed on the level of a reference year; this is called a chain-linked series. Accordingly, price movements will not inflate the growth rate.

**Inflation:** Harmonised Indices of Consumer Prices (HICPs) are designed for international comparisons of consumer price inflation. HICP is used for example by the European Central Bank in monitoring of inflation in the Economic and Monetary Union and for the assessment of inflation convergence as required under Article 121 of the Treaty of Amsterdam.

**GINI:** As the measure of income inequality we use gini coefficients based on the income distribution data compiled by World Bank. Income inequality is measured using the percantage share of income of the wealthiest 10 percent of a countyr's population. The Gini coefficient can range from 0 to 100. A low Gini coefficient indicates a more equal distribution, with 0 corresponding to complete equality, while higher Gini coefficients indicate more inequal income distribution, with 100 corresponding to complete inequality.

---

[2] Two countries from eastern Europe, Bulgaria and Romania, joined in the EU in 2007, brining the number of the member states to 27 countries..

**Economic Freedom:** index of freedom is provided by the Freedom House since 1997. This index measuring the degree of economic freedom presents in five major areas: 1) government expenditures, taxes and enterprise; laws 2) legal structure and security of property rights; 3) access to sound money 4) freedom to exchange with foreigners; and 5) regulating of credit, labor and business. The scale for this index is range from 0 to 10 with a high score reflecting more economic freedom

**Appendix 3. The relationship between dependent variables and independent variables**
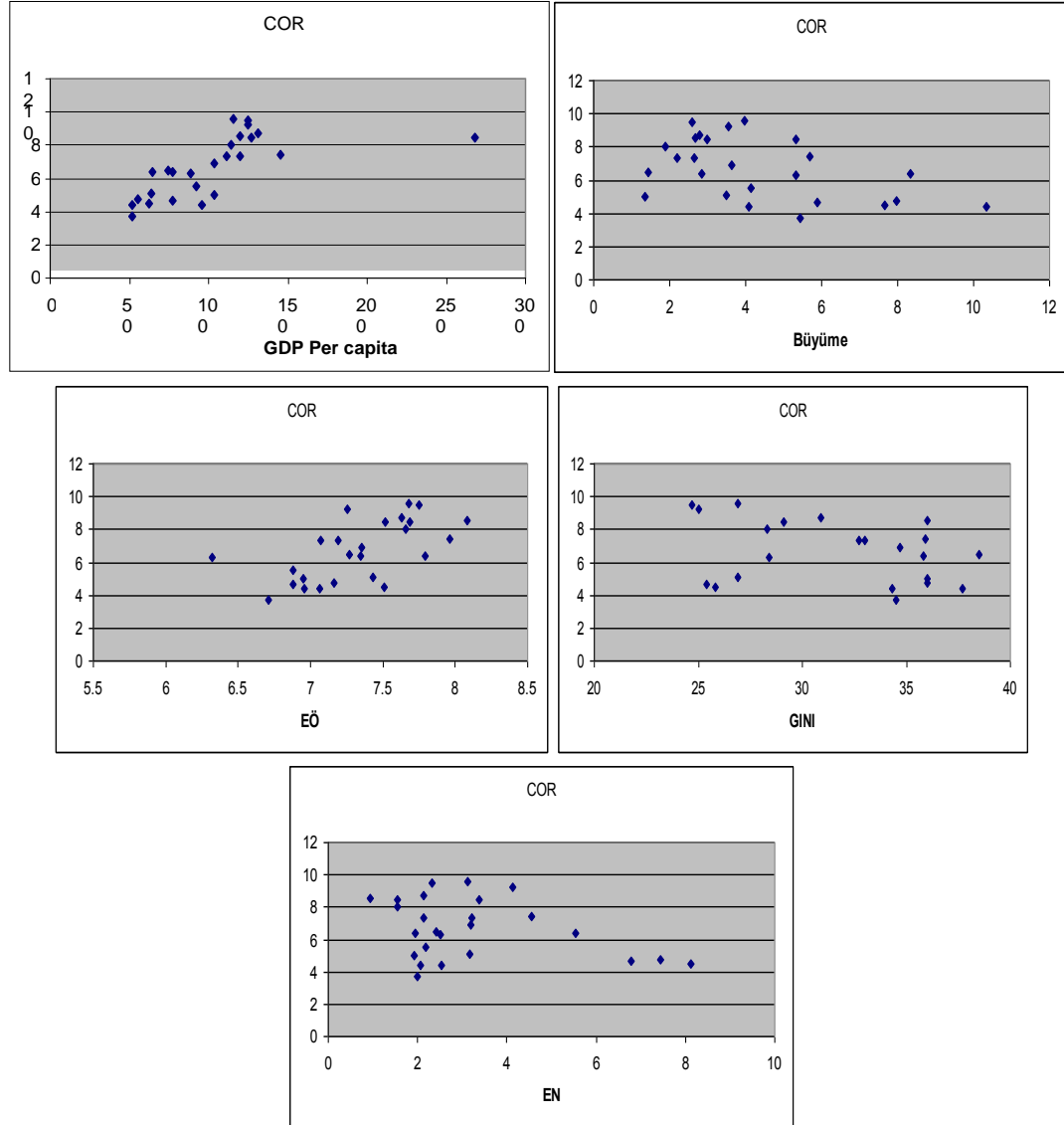
**REFERENCES**

**ABED, G. T. and S. GUPTA (2002)** *"The Economics of Corruption: An Overview",* Governance, Corruption & Economic Performance, Ed. G. T. Abed and S. Gupta, IMF Press, September,http://www.imf.org/external/pubs/ntf/2002/govern/index.htm Access Date:      10.23.2005.

**ADAMAN, F., A. ÇARKOĞLU and B. ŞENATALAR (2001)** Causes of Corruption in Turkey Through The Eyes of Household and Recommendations on the Prevention of Corruption, TESEV Publisher, No. 24, Istanbul

**ALAM, M. (1995)** *"A Theory Of Limits On Corruption and Some Applications",* Kyklos, Vol. 48, pp. 419-435.

**AKÇAY, S. (2001)** Economic Analysis of Corruption in Developing Countries, Unpublished Doctoral Thesis, Afyon Kocatepe University Institute of Social Sciences, October, Afyon.

**AKÇAY, S. (2000)** *"Corruption, Economic Freedom and Democracy"*, Mugla University Journal of Economics and Administrative Sciences. Vol.1, No.1, pp. 1-15.

**AKTAN, C. C. (2001)** *"Political Ethics and Political Corruption"*, Anti-Corruption Strategies, Ed. C. C. Aktan, Hak-İş Press., pp. 51-69.

**AIDT, T. S. (2003)** *"Economic Analysis of Corruption: A Survey"*, The Economic Journal, 113, November, pp. 632-652.

**ANDVING, J. C. Et al. (2000)** Research on Corruption: A Policy Oriented Survey, Commissioned by NORAD, Final Report, December, Oslo.

**BARDHAN, P. (1997)** *"Corruption and Development"*, Journal of Economic Literatüre, Vol. 35, September, pp.1320-1346.

**BAŞAR, S. (2004)** *"Effects of Corruption on Foreign Direct Investmenti"*, İktisat, İşletme ve Finans, Vol. 19, No. 222, pp. 66-76.

**BRAUN, M. and R. D. TELLA (2000)** "*Inflation, Inflation Variability and   Corruption",* Economics & Politics, Vol. 16, No. 1, March, pp.77-100.

**CHAFUEN, A. A. and E. GUZMAN (2000)** *"Economic Freedom and Corruption",* 2000 Index of Economic Freedom, Heritage Foundation Press, pp. 51-63.

**CUADRADO, R. C. (2005)** *"Corruption: A Corporate Perspectives",* Facultad de Ciencias Economicas y Empresariales Universidad de Navara, Working Paper No.11/05.

**ENTORF, H. and H. SPENGLER (2000)** "*Socioeconomic and Demographic Factors of Crime in Germany: Evidence From Panel Data of The German States"*, International Review of Law and Economics, Vol. 20, pp. 75-106.

**GOEL, R. K. and M. A. NELSON (2005)** *"Economic Freedom Versus Political Freedom: Cross-Country Influences on Corruption"*, Australian Economic Papers, June, pp.121-133.

**GRAY, C. W. and D.KAUFMAN (1998)** *"Corruption and Development"*, Finance Development, Vol. 35, No. 1, March, pp.7-11.

**GUJARATI, D. N. (2003)** Basic Econometrics, McGraw-Hill Publisher, 1. Edition New Yorkl.

**GÜVEL, E. A. (2004)** 'Economics of Crime and Punisment', Roma Publisher, Ankara, May.

**GÜVEL, E. A. (1998)** *"Economic Analyisis of the Buaucratic and Political Corruption"*, İşletme Finans Dergisi, May, pp. 26-37.

**HESSEL, M and K. MURPHY (2002)** *"Stealing the State, and Everything Else A Survey of Corruption in the Postcommunist World",* Transparency International, Working Paper, Berlin.

**HUSTED, B. W. (1999)** *"Wealth, Culture and Corruption"*, Journal of International Business Studies, Vol. 30, No. 2, pp.339-360.

**KAR, M. and N. CÖMERTLER (2007)** "Economic and Social Determinants of the Crime Rate in Turkey: Cross-Section Analysis*",* Ankara University Journal of Economics and Administrative Sciences, Vol.. 62, No.2, pp.1-17.

**KHAN, M. M. (2004)** "*Political and Administrative Corruption: Concepts, Comparative Experiences and Bangladesh Case"*, http://www.ti-bangladesh.org, Access Date: 05.17.2005.

**KENNEDY, P. (2000)** Handbook of Econometrics, Trans. M. Sarımeşeli, Gazi Publisher, Ankara.

**KLITGAARD, R. (1988)** Controlling Corruption, University of California Press, England.

**KURER, O. (1993)** *"Clientelism, Corruption and The Allocation of Resources",* Public Choice, Vol. 77, pp.259-273.

**LAMBSDORFF, J. G. (2007)** The Institutional Economics of Corruption and Reform, Cambridge University Press.

**LEDERMAN, D., N. V. LOAYZA and R. R. SOARES (2005)** *"Accountability and Corruption:Political Institutions Matter"*, Economics and Politics, Vol. 17, No. 1, March, pp.1-35.

**LEITE, C. and J. WEIDEMANN (1999)** *"Does Mother Nature Corrupt? Natural Resources, Corruption and Economic Growth"*, IMF Working Paper, 85, July.

**LUO, Y. (2004);** *"An Organizational Perspectives of Corruption"*, Management and Organization Review, 1:1, pp. 119-154.

**MONTINOLA G. R. and R. W. JACKMAN (2002)** *"Sources of Corruption: A Cross-Country Study",* B. J. Pol. S. 32, Cambridge University Press. pp. 147-170.

**MORGAN, A. L. (1998)** *"Corruption: Causes, Consequences and Implications",* The Asia Foundation Working Paper Series, No: 9, October.

**MYINT, U. (2000)** *"Corruption: Causes, Consequences and Cures"*, Asia-Pasific Development Journal, Vol. 7, No. 2, December, pp.33-58.

**ÖZSEMERCİ, K. (2003)** The Corruption on Turkish Public Administration: The Causes, Consequences and Combating of the Corruption , Court Research/Review/Translation Series: 27, Court Published, October, Ankara.

**PALDAM, M. (2002)** *"The Cross-Country Pattern of Corruption: Economics, Culture and Seesaw Dynamic"*, European Journal of Political Economy, Vol. 18, pp. 215-240.

**PORTA, D. DELLA and A. VANNUCCI (2005)** *The Governance Mechanisms of Corrupt Transactions"*, The New Institutional Economics of Corruption, Ed. J. G. Lambsdorff, M. Taube and M. Schramm, Routledge Press, pp.152-180.

**ROSE-ACKERMAN, S. (1999)** Corruption and Government: Causes, Consequences and Reform, Cambridge University Press.

**SAYAN, İ. Ö. and M. KIŞLALI (2004)** *"The Study of Econometric on Corruption"*, The Journal of Public Administration, TODAIi, Vol. 37, No. 2, June, pp.33-52.

**SHEN, C. and J. B. WILLIAMSON (2005)** *"Corruption, Democracy, Economic Freedom and State Strength",* International Journal of Comparative Sociology, Vol. 46(4), pp.327-345.

**ŞANLI, U. (2006)** " The Role and Influencce of the Intelligence Services on The Combating of Corruption*",* Corruption, Ed. S. Aydın, Turhan Publisheri, Ankara, pp. 535-551.

**TANZI, V. (1998)** *"Corruption Around The World: Causes, Consequences, Scope and Cures",* IMF Staff Papers, Vol. 45, No. 4, December, pp.559-594.

**TBMM RESEARCH COMMISSION REPORT (2006)** *"Corruption:It's Causes, Consequences and Cures",* TBMM Research Commıssıon Report No. 10/9), Ankara.

**THOMAS, M. A. and P. MEAGHER (2004)** "*A Corruption Primer: An Overview of Concepts in The Corruption Literatüre"*, The IRIS Discussion Papers on Institutions and Development, Paper No. 04/03, February.

**TOSUN, M. U. (2002)** "Failure of a Public Corruption as the Product*",* Corruption and Efficient Government, Ankara Chamber of Commerce Publisher, December, Ankara, pp. 19-105.

**TREISMAN, D. (2000)** *"The Causes of Corruption: A Cross-National Study*", Journal of Public Economics, 76, pp. 399-457.

**UNODC (2004)** Practical Anti-Corruption Measured for Prosecutors and Investigators, United Nations Office On Drugs And Crime (UNODC) Press, Vienna, September.

**WOOLDRIDGE, J. M. (2001)** Econometric Analysis of Cross Section and Panel Data, The MIT Press, Cambridge, Massachusetts London, England.

**WORLD BANK (2000)** "Helping Countries Combat Corruption", World Bank Publisher, June.

**VAZQUEZ-MARTINEZ, J., F. J. ARZE and J. BOEX (2004)** Corruption, Fiscal Policy and Fiscal Management, USAID Press, October.

**VINOD, H. D. (1999)** *"Statistical Analysis of Corruption Data and Using The Internet to Reduce Corruption"*, Journal of Asian Economics, Vol.10, No.4, pp. 591-603.

**XIN X. and T. K. RUDEL (2004)** *"The Context for Political Corruption: A Cross-National Analysis"*, Social Science Quarterly, Vol. 85, No. 2, June, pp. 294-309.

**YOU, J-S and S. KHAGRAM (2005)** *"A Comparative Study of Ineguality and Corruption",* American Sociological Review**,** 70, pp. 136-157.