# CORRUPTION AND ECONOMIC GROWTH: A CROSS-NATIONAL STUDY

**Selçuk Akçay**
Afyon Kocatepe Üniversitesi
İktisadi ve İdari Bilimler Fakültesi

•••

*Yolsuzluk ve Ekonomik Büyüme: Ülkelerarası Bir Çalışma*

## Özet

Gelişmiş ve gelişmekte olan ülkelerde, sosyal, siyasal ve kurumsal faktörler gelişmeyi ve ekonomik büyümeyi engellemede önemli rol oynamaktadır. Ciddi kurumsal zayıflıkların bir belirtisi olan yolsuzluk, yatırımları ve harcamaları (sağlık ve eğitim) azaltma, gelir dağılımı eşitsizliklerini artırma, yabancı dolaysız yatırımları azaltma, piyasalarda ve kaynakların dağıtımında sapmalara neden olmakla sorumlu tutulmaktadır. Bazı yazarlar, yolsuzluğun aynı zamanda düşük ekonomik büyümeye neden olduğunu ileri sürmektedirler. Bu çalışmanın amacı gelişmiş ve gelişmekte olan 54 ülkede, 1960-1995 yılları arasında yolsuzluğun ekonomik büyüme üzerine etkisini incelemektir. Çalışmada, Barro (1991) ve Mauro'nun (1995, 1997) teorik yaklaşımları kullanılmış ve yolsuzluk ile ekonomik büyüme arasında istatistik bakımından anlamlı negatif bir ilişki bulunmuştur. Ekonomik büyüme ile yolsuzluk arasındaki bu ilişki ekonomik büyümenin diğer belirleyecilerinin analize katılması ile güçlülük kazanmıştır.

## Abstract

Social, political and institutional factors play a major role in the retarding of development and economic growth in many developing and developed countries. Corruption, which is a symptom of deep institutional weaknesses, is blamed for reducing investments and expenditures (for education and health), increasing income inequality, reducing foreign direct investments, distorting markets, and allocation of resources. Some writers argue that corruption is also responsible for a low economic growth rate. The purpose of this paper is to examine the impact of corruption on economic growth across 54 developing and developed countries for the period of 1960-1995. Based on the theoretical framework of Barro (1991) and Mauro (1995, 1997), the empirical evidence presented suggests that there is a statistic ally significant negative relationship between corruption and economic growth. The relationship is directly related to inclusion of other determinants of economic growth.

# Corruption and Economic Growth: A Cross-National Study

## INTRODUCTION

Corruption, defined as the abuse of public office (roles) for private benefit (JOHNSTON, 1998: 89), is a universal problem. It can be seen on every wealthy and poor nation in different extent and forms. Corruption which takes many forms including bribery, extortion, nepotism, embezzlement, fraud, insider trading and conflict of interest, is blamed for reducing investments, growth and expenditures (for education and health), increasing income inequality, distorting markets and allocation of resources.[1] Corruption also causes political instability, weakens administrative capacity, undermines democracy and national integration.

James D. Wolfensohn, president of the World Bank in his address to the Board of Governance pointed out that:

The causes of financial crises and poverty are one and the same ... if (countries) do not have good governance, if they do not confront the issue of corruption, if they do not have complete legal system which protects property rights and contracts .... their development is fundamentally flawed and will not last.

The aim of this paper is to study impact of corruption on economic growth across 54 developing and developed nations for the period 1960 to1995. The study is based on theoretical framework of Barro (1991) and Mauro (1995,1997). However it differs from Mauro's from two aspects. Firstly, Mauro's cross-country regressions covers the period of 1960-1985 whereas this study covers the period of 1960-1995. Secondly, new control variables such as inflation rate (proxy for macroeconomic instability), pupil/teacher

1 See Tanzi (1998) and Ackerman (1999) for more information about types, causes and consequences of corruption.

ratio (as proxy for quality of human capital) and regional dummy (Africa) are added to the model.[2]

The paper is structured as follows. Section I summarizes selected literature on corruption and economic growth. Section II, describes methodology, data and model. Section III discusses regression results. Section IV concludes.

## I. LITERATURE REVIEW

In corruption literature, there are two major arguments about effects of corruption which are named as efficiency reducing and efficiency enhancing arguments. On one hand, advocates of efficiency reducing argument like McMullan (1961), Krueger (1974), Myrdal (1968), Shleifer and Vishny (1993), Tanzi (1997), and Mauro (1995) have claimed that corruption hinders economic growth, distorts markets and allocation of resources .

On the other hand, advocates of efficiency enhancing argument, like Leff (1964), Huntington (1968), Friedrich (1972) and Nye (1967) have suggested that corruption may help economic growth. They claimed that corruption may allow business actors to work around pervasive and inefficient bureaucratic procedures, reducing some of the adverse effects of red tape. Huntington states that: "In terms of economic growth, the only thing worse than a society with a rigid, overcentralized, dishonest bureaucracy is one with rigid, over centralized, honest bureaucracy" (HUNTINGTON, 1968:386). Under these circumstances, it is reasonable that corruption may enhance the efficiency of the system and as a result help economic growth .

In recent years, there has been considerable empirical studies about impact of corruption. The emergence of indices on corruption enable researchers to do empirical studies about causes[3] and consequences of corruption. These empirical studies reveal that corruption reduces growth and investment, increases poverty and inequality and distorts allocation of resources.

The first econometric study about impact of corruption on economic growth and investment across countries was done by Mauro. Mauro used Business International (BI) data for 67 countries for the period 1980-1983 and found a significant negative relation between corruption and the average annual economic growth rate over 1960-1985 period. His empirical analysis revealed that, "a onestandard deviation improvement in corruption index causes investment to rise by 5 percent of GDP and the annual rate of growth of GDP per capita to rise by 0.5 percentage point" (MAURO, 1995:704).

2 James D. Wolfensohn, Adress to the Board of Governors, September 28, 1999.

3 See Husted (1999), Treisman (2000) and Getz and Volkema (2001) for empirical analysis of causes of corruption

Mauro, extended his previous study by increasing the number of countries in the sample (94) and results of this extended study verify his previous results that corruption significantly hinders economic growth and investment. In quantitative terms, Mauro's cross country analysis (94 countries) suggests that a reduction in corruption of his 10 point scale would increase a country's annual investment by 4 percent of gross domestic product (GDP), and would increase annual growth of GDP per capita by 0.5 percent (MAURO, 1997: 91).

Using equilibrium models of endogenous growth, Ehrlich and Lui investigated the link between corruption, government and growth. The authors concluded that:

> The relationship between government, corruption, and the economy's growth is nonlinear. Government intervention in private economic activity hurts most in the poorest countries and those at a critical takeoff level. This may explain the prevalence of corruption in countries trapped in poverty, such as Zaire and Haiti (LUI /EHRLICH,1999: 291-292).

Mendez and Sepulveda examined impact of corruption on growth by a dynamic general equilibrium model. The authors found out that :

> Corruption has two separate effects: on one hand, it fosters economic growth by allowing the private agents to circumvent existing regulations; on the other hand, corruption represents a drain on investment. The relative size of these effects determines the total impact of corruption on income growth (MENDEZ/SEPULVEDA, 2000: 5).

Li, Xu and Zou (2000), studied corruption and how it affects income distribution and growth across 47 developing and developed countries. They found that, corruption has a negative effect on growth, but its effect is not very significant.

## II. METHODOLOGY, DATA AND MODEL

In order to measure impact of corruption on economic growth the basic theoretical framework outlined in Barro (1991) and Mauro (1995, 1997) is used for analysis. Barro's framework can be specified as follows:

$G_Y (i,t) = \alpha - y (i,0) + \text{control variables} + \varepsilon$

Where;

$G_Y (i,t)$ = is the growth rate of per capita GDP of a country i from period *0* to period t.

y ( i,0) = is the log of country i's per capita GDP at time 0. In other words y(i,0) is the initial level of real GDP per capita. Coefficient of y( i,0) is expected to be negative (- $\alpha$) due to the theory of convergence. According to this theory there is a negative relation between initial level of income and income growth.

Mauro (1995) extended Barro's framework by adding corruption to the growth equation .

$G_y$ (i,t) = - $\alpha$ y ( i,0) + $\beta$ corruption + control variables + $\varepsilon$

In estimating the relationship between corruption and growth, it is important to control for other determinants of growth rate, to ensure that estimated coefficient capture the effect of corruption on growth.

In this study, secondary school enrollment rate (proxy for quantity of human capital), pupil/teacher ratio (proxy for quality of human capital), the share of the government consumption in GDP, annual population growth, gross domestic investment-GDP ratio and macroeconomic stability (annual inflation rate) are used as control variables.

The model used in this paper can be specified as follows:

G=f(Y, C, LC, SSER, PTRSC, GDI, GC, POP, INF, D) (1)

Where ;

G = is the growth rate of per capita GDP

Y = Per capita GDP, initial value (1960)

C = Corruption index

SSER = Secondary school enrollment rate,

PTRSC = Pupil /teacher ratio in secondary school,

GDI = Gross domestic investment - GDP ratio

GC = Government consumption as % of GDP

POP = Average annual population growth

INF = Inflation rate, period average

$D_{afr}$ = Dummy for Africa

The mathematical expression of the model is as follows:

$G = \alpha + \beta_1 Y + \beta_1 C + \beta_2 SSER + \beta_3 PTRSC + \beta_4 GDI + \beta_5 GC + \beta_6 POP +$

$\beta_7 INF + \beta_8 D_{afr} + \varepsilon$ (2)

The explanatory variables and their expected signs are indicated in Table 1.

*Table 1. The Explanatory Variables and Their Expected Signs*

| Explanatory Variables | Expected Sign |
|---|---|
| Y = Log of Per capita GDP (initial value) | - |
| C = Corruption index | + |
| SSER = Secondary school enrollment rate, | + |
| PTRSC = Pupil /teacher ratio in secondary school | - |
| GDI = Gross domestic investment – GDP ratio | + |
| GC = Government consumption as % of GDP | - |
| POP = Average annual population growth | - |
| INF = Log of Inflation rate, (period average) | - |
| $D_{afr}$ = Dummy for Africa | - |

In this paper, due to the unavailability of time series data a cross country empirical analysis is presented. The empirical analysis is based on cross-country data of 54 developing and developed countries. List of countries is indicated in Appendix 1.

The dependent variable, growth rate is measured by average annual growth rate of per capita GDP for the period 1960 to1995. The initial level of per capita GDP (1960) is added to the model to control for the neoclassical convergence effect. The quantity of human capital is measured by secondary school enrollment rate. The quality of human capital is measured by the pupil/teacher ratio in secondary school. For corruption variable, International Country Risk Guide's (ICRG) corruption index[4] (averaged 1982-95) is used. It ranges from 10 (no corruption) to 0 (maximum corruption). For macroeconomic stability, inflation rate (averaged 1960-95) is used. Descriptive statistics about variables that used in the model is indicated in Appendix 2. Correlation matrix is presented in Appendix 3.

Average annual income growth rate (1960-1995), GDP per capita, initial level (1960), average population growth rate (1960-1995), inflation rate (1960-1995), secondary school enrollment rate (1990), pupil/teacher ratio in

4 Index indicates the opinion of analysts on each country regarding the extent to which high government officials are likely to demand special payments, and illegal payments generally expected throughout lower levels of government in the form of bribes connected with import and export licences, exchange controls, tax assesment, policy protection or loans.

secondary school (1990), gross domestic investmentGDP ratio (average for 1970-1995) data are taken from World Bank's internet data base. Data related to corruption and government consumption as of % GDP (average for 1960-1995) are obtained from Levine-Loayza- Beck data set.[5]

## III. REGRESSION RESULTS

The method of ordinary least squares (OLS) is employed to estimate the equation (1) using cross section data on the variables included in the model. Results of the models explaining the differences in growth rates across countries are reported in Table 2. All of the coefficients have the expected signs, even though not all are statistically significant. Government consumption variable (% of GDP for the 1960-1995 period) is not statistically significant in any model.

*Table 2. Effect of Corruption on growth in per capita income 1960-1995*

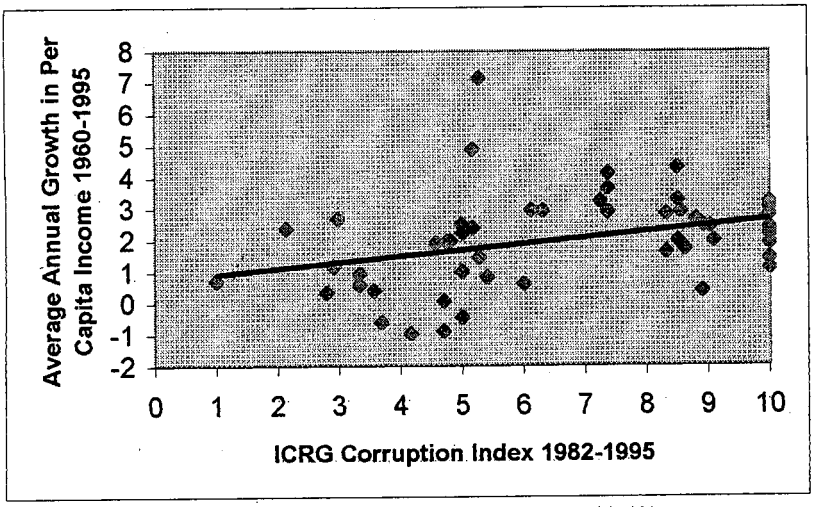
| Variable | Base Model | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|---|---|---|---|---|---|
| İntercept | 15.487 | 6.142 | 7.539 | 9.071 | 10.879 | 12.144 |
| | (4.873)*** | (1.796)* | (2.121)** | (2.639)*** | 3.229)*** | (3.776)*** |
| Y | -2.101 | -1.119 | -1.288 | -1.328 | -1.432 | -1.538 |
| | (-4.860)*** | (-2.622)*** | (-2.957)*** | (-3.224)*** | (-3.644)*** | (-4.206)*** |
| PTRSC | -0.0759 | -0.038 | -0.050 | -0.071 | -0.064 | -0.055 |
| | (-2.216)** | (-1.261) | (-1.607) | (-2.285)*** | (-2.184)** | (-1.952)* |
| SSER | 0.369 | 0.194 | 0.119 | 0.214 | 0.158 | 0.107 |
| | (3.339)*** | (1.618) | (1.745)* | (1.891)* | (1.430) | (1.006) |
| C | 0.339 | 0.243 | 0.362 | 0.341 | 0.248 | 0.330 |
| | (2.856)*** | (2.271)** | (2.652)*** | (2.632)*** | (1.894)* | (2.560)*** |
| GDI | | 0.120 | 0.112 | 0.100 | 0.112 | 0.083 |
| | | (3.184)*** | (2.893)*** | (2.729)*** | 3.180)*** | (2.343)** |
| GC | | | -0.041 | -0.054 | -0.028 | -0.016 |
| | | | (-0.954) | (-1.320) | (-0.681) | (-0.429) |
| INF | | | | -2.175 | -1.787 | -1.793 |
| | | | | (-2.91)** | (-1.783)* | (-1.902)* |
| POP | | | | | -0.461 | -0.390 |
| | | | | | (-2.043)** | (-1.813)* |
| D | | | | | | -1.173 |
| | | | | | | (2.101)** |
| Astudred R2 | 0.43 | 0.53 | 0.55 | 0.60 | 0.64 | 0.68 |
| F statistic | 9.28 | 9.03 | 8.09 | 8.39 | 8.73 | 9.27 |
| # Obser | 54 | 54 | 54 | 54 | 54 | 54 |

*Numbers in parentheses are heteroscedasticity consistent t ratios. *. ** and *** denote significance at the 10%, 5% and 1% level respectively.*

5 LEVINE et al., World Bank,www.worldbank.org/research/growth/llbdata.htm.

Since ICRG corruption index's higher values show less corrupt countries, a positive relationship between corruption and economic growth is expected. This relationship is indicated in Figure 1.

Figure 1. Corruption and Economic Growth , 1960-1995




In all models coefficient of corruption variable has a positive sign and statistically significant. For example one standard deviation improvement in the corruption index would increase growth, by 0.33 points (model-5). The coefficient on initial per capita GDP is negative and statistically significant in all models. This indicates that there could be a convergence effect in this sample of developing and developed countries. In other words poor countries all else being equal tend to grow relatively more quickly.

Regression results reveal that an increase in gross domestic investmentGDP ratio would raise growth. As it can be seen from Table 2 the estimated coefficient of gross domestic investmentGDP ratio is positive and highly significant in all models. Quantitatively, one standard deviation increase in gross domestic investmentGDP ratio can lead to 0.10 points increase in growth (model 3).

In empirical analysis secondary school enrollment rate for (1990) and pupil /teacher ratio for (1990) are used as quantity and quality of human capital respectively. As expected, the quantity of human capital has a positive sign and indicating that impact of education on growth is positive. The quality of human capital has a negative sign. Both quantity and quality of human capital is statistically significant at 5 and 1 percent level respectively in base model.

Inflation rate which is used as a proxy for macroeconomic instability, has a negative effect on growth. The magnitude of the effect is considerable: a one standard deviation increase in inflation rate is associated with 1.7 points decrease in growth (model 5). Population growth rate also has a negative and significant effect on growth. For example, a one standard deviation increase in population growth rate would decrease growth by 0.39 points (model 5).

As expected, the dummy variable for African countries is negative and significant, indicating that other things being equal, African countries would be expected to have lower economic growth.

## IV. CONCLUSION

This paper examines the effect of corruption on economic growth across 54 developed and developing countries. Empirical analysis indicates that corruption has a statistically significant and negative effect on economic growth. Empirical findings also reveal that while inflation rate, population growth rate, government consumption, pupil/teacher ratio (proxy for quality of human capital) affects growth negatively, secondary school enrollment rate (proxy for quantity of human capital) and gross domestic investment affects positively.

*Appendix 1. List of Countries*

Argentina, Bangladesh, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Ghana, Guatemala, Honduras, India, Jamaica, Jordan, Kenya, South Korea ,Malaysia, Mauritius, Mexico, Pakistan, Paraguay, Peru, Philippines, Senegal, South Africa, Taiwan, Thailand, Uruguay, Venezuela, Zimbabwe, Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

*Appendix 2. Descriptive Statistics*

| | N | Minimum | Maximum | Mean | Std.Dev |
|---|---|---|---|---|---|
| GROWTH | 54 | -0.15 | 6.66 | 2.312 | 1.479 |
| Log Y | 54 | 6.46 | 9.20 | 7.845 | 0.799 |
| PTRSC | 47 | 6.70 | 34.20 | 16.968 | 6.616 |
| SSER | 54 | 1.88 | 12 | 6.343 | 2.673 |
| C | 52 | 1.01 | 10 | 6.575 | 2.558 |
| GDI | 45 | 11.13 | 31.62 | 22.074 | 4.320 |
| GC | 53 | 6.68 | 30.63 | 14.347 | 4.889 |
| INF | 54 | 0.04 | 0.65 | 0.142 | 0.136 |
| POP | 54 | 0.26 | 3.33 | 1.698 | 0.982 |
| D | 54 | 0 | 1 | 0.111 | 0.317 |

*Appendix 3. Correlation Matrix*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.GROWTH | 1 | | | | | | | | | |
| 2.Log Y | 0.04 | 1 | | | | | | | | |
| 3.PTRSC | -0.16 | -0.62 | 1 | | | | | | | |
| 4.SSER | 0.38 | 0.79 | -0.47 | 1 | | | | | | |
| 5.C | 0.39 | 0.79 | -0.57 | 0.77 | 1 | | | | | |
| 6.GDI | 0.62 | 0.14 | -0.19 | 0.33 | 0.33 | 1 | | | | |
| 7.GC | 0.27 | 0.51 | -0.44 | 0.60 | 0.70 | 0.08 | 1 | | | |
| 8.INF | -0.32 | -0.09 | -0.14 | -0.16 | -0.26 | -0.19 | -0.22 | 1 | | |
| 9.POP | -0.40 | -0.71 | 0.49 | -0.67 | -0.67 | -0.15 | -0.39 | 0.19 | 1 | |
| 10.D | -0.32 | -0.31 | 0.35 | -0.40 | -0.11 | -0.26 | -0.05 | -0.05 | 0.35 | 1 |

## References


ACKERMAN, Susan R. (1999), *Corruption and Government: Causes, Consequences, and Reform* (Cambridge: Cambridge University Press, UK).

BARRO, Robert J. (1991), "Economic Growth in a Cross Section of Countries," *Quarterly Journal of Economics* (Vol 106, No 2): 407-443.

Friedrich, C.J. (1972), The Pathology of Politics, Violence, Betrayal, Corruption, Secrecy and Propaganda (New York: Harper and Row).

GETZ, Kathleen A./VOLKEMA, Roger J., (2001), "Culture, Perceived Corruption, and Economics: A Model of Predictors and Outcomes," *Business and Society* (Vol 40, No.1): 7-30.

HUNTINGTON, Samuel P. (1968), *Political Order in Changing Societies* (New Haven :Yale University Press).

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

KRUEGER, Anne O. (1974), "The Political Economy of the Rent Seeking Society," *American Economic Review* (Vol 64, No 3): 291-303.

LAMBSDORFF, Johann G. (1999), "Corruption in Empirical Research- A Review," *Transparency International Working Paper* (Berlin).

LEFF, Nathaniel H. (1964), "Economic Development through Bureaucratic Corruption," *The American Behavioral Scientist* (Vol 8, No 2): 8-14.

LEVINE, Ross/LOAYZA, Norman/BECK, Thorsten, Data Set, World Bank, www.worldbank.org/research/growth/llbdata.htm.

LI, Hongyi/XU, Lixin C/ZOU, Heng-Fu (2000), "Corruption, Income Distribution, and Growth," *Economics and Politics* (Vol 12, No 2): 155-182.

LUI, Francis T/EHRLICH, Isaac (1999), "Bureaucratic Corruption and Endogenous Economic Growth," *Journal of Political Economy* (Vol 107, No 6): 270-293.

MAURO, Paolo, (1995), "Corruption and Growth," *Quarterly Journal of Economics* (Vol 110, No 3): 681-712.

MAURO, Paolo (1997), "The Effects of Corruption on Growth, Investment, and Government Expenditure: A Cross Country Analysis," ELLIOT, Kimberly A. (ed.), *Corruption in the Global Economy* (Institute for International Economics, Washington, USA):83-107.

McMULLAN, M. (1961), "A Theory of Corruption," *Sociological Review* (Vol 9, No 2): 181-201.

MENDEZ, Fabio, SEPULVEDA, Facundo (2000), "Corruption and Growth: Theory and Evidence," *Working Paper* (Department of Economics, Michigan State University).

MYRDAL, Gunnar (1968), *Asian Drama: An Inquary into the Poverty of the Nations* (New York: Random House).

NYE, Joseph S. (1967), "Corruption and Political Development: A Cost-Benefit Analysis," *American Political Science Review* (Vol 61, No 2): 417-27.

RAHMAN, Aminur / KISUNKO, Gregory / KAPOOR, Kapil (2000), "Estimating the Effects of Corruption : Implications for Bangladesh," *Policy Research Working Paper*, No. 2479 (The World Bank, South Asia Region, Poverty Reduction and Economic Management Sector Unit).

SHLEIFER, Andrei / VISHNY Robert W. (1993), "Corruption," *Quarterly Journal of Economics* (Vol 108, No 3): 599-617.

TANZI, Vito / DAVOODI, Hamid, (1997), "Corruption, Public Investment, and Growth," *IMF Working Paper* (Washington: WP/97/139, International Monetary Fund).

TANZI, Vito (1998), "Corruption Around the World: Causes, Consequences, Scope, and Cures," *IMF Working Paper* (Washington: WP/98/63, International Monetary Fund).

THEOBALD, Robin (1990), *Corruption, Development and Underdevelopment* (Durham: Duke University Press).

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

WOLFENSOHN, James D. (1999), *Address to the Board of Governors, September 28, 1999.*