Does corruption have a significant effect on economic growth?

An empirical analysis examining the relationship between corruption and economic growth in developing countries.

By: Alex Mikaelsson & Saliou Sall
Mentor: Stig Blomskog
Abstract

Corruption is a major cause and result of poverty around the globe. It arises at all levels of society, from national governments and military to small businesses and sports. Corruption affects all elements of society in some way as it undermines democracy and economic growth as well as the environment and people’s health.

The main purpose of this thesis is to examine if corruption has a significant effect on economic growth in developing countries. The empirical analysis is conducted with a regression analysis, using data from recognized institutions. Other variables that can affect GDP per capita growth are also examined such as the level of democracy, fertility rate, life expectancy, education and the Initial GDP per capita to test for conditional convergence. In our main model, the empirical results show that corruption does not have a significant effect on economic growth but this is basically due to that the model exhibits multicollinearity. In our second model, where we omitted the variables Democracy, Initial GDP and Life expectancy, we found that corruption has a significant, negative effect on economic growth. This is in accordance with previous empirical results which hold that more corruption in a nation leads to less economic growth.

Key words

Economic growth, Corruption, Principal-agent theory, Institutions, Regression analysis

Acknowledgments

The first person we wish to thank is our teacher Thomas Marmefelt, whose informative and productive lectures in Macroeconomics has provided us with the necessary foundation to carry out this study. We would also like to acknowledge our mentor Stig Blomskog for his patience and constructive critique on our thesis, which has helped us reach our goal.
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.1 INTRODUCTION TO ECONOMIC GROWTH</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.2 DEFINITION OF ECONOMIC GROWTH</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.3 INTRODUCTION TO CORRUPTION</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.4 PROBLEM STATEMENT</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1.5 PURPOSE AND METHODOLOGY</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1.6 CONTRIBUTION TO THE LITERATURE</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1.7 THESIS STRUCTURE</td>
<td>2</td>
</tr>
<tr>
<td>2.</td>
<td>DEFINITIONS</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>PREVIOUS STUDIES</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3.1 PREVIOUS STUDIES ABOUT ECONOMIC GROWTH</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3.2 PREVIOUS STUDIES ABOUT CORRUPTION</td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>THEORETICAL ANALYSIS</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>4.1 PRINCIPAL-AGENT THEORY</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>4.2 INSTITUTIONS THAT PROMOTE ECONOMIC GROWTH</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>4.3 INSTITUTIONS ROLE IN PRINCIPAL-AGENT MODEL</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>4.4 PRINCIPAL-AGENT THEORY AND CORRUPTION</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>4.5 PUBLIC CHOICE THEORY AND CORRUPTION</td>
<td>9</td>
</tr>
<tr>
<td>5.</td>
<td>CORRUPTION</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>5.1 DEFINITION OF CORRUPTION</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>5.2 ECONOMIC THEORY AND CORRUPTION</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>5.3 TYPES OF CORRUPTION</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>5.3.1 CORRUPTION FOR THE ACCELERATION OF PROCESSES</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>5.3.2 ADMINISTRATIVE CORRUPTION</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>5.3.3 STATE CAPTURE</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>5.4 BASIC CAUSES AND EFFECTS OF CORRUPTION</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>5.4.1 THE EFFECT CORRUPTION HAS ON SOCIETY</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>5.4.2 HOW CORRUPTION AFFECTS INVESTORS</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>5.4.3 RENT SEEKING AND THE EFFECT OF CORRUPTION ON THE FREE MARKET</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>5.4.4 THE EFFECT OF CORRUPTION OF PROPERTY RIGHTS AND EFFICIENT CONTRACT ENFORCEMENT</td>
<td>13</td>
</tr>
</tbody>
</table>
5.4.5 UTILITARIANISM, ETHICS AND CORRUPTION..........................14
5.5 ECONOMICS OF CORRUPTION..................................................14
  5.5.1 VALIDITY OF THE CPI.............................................................15

6. **EMPIRICAL ANALYSIS.................................................................15
  6.1 Introduction to the regression model and variables ..................15
  6.2 Regression model.................................................................16
  6.3 Explanation of variables and expected signs..........................16
  6.4 Regression variables, sources, expected signs and results........19
  6.5 Results of regression.............................................................20

7. **CONCLUSION.............................................................................21
  7.1 Results of regression and concluding remarks.......................21
Results

TABLES

1. **TABLE 1**: REGRESSION VARIABLES, SOURCES AND SIGNS.................19
2. **TABLE 2**: REGRESSION RESULTS.............................................19
1. Introduction

This section will start by giving an introduction to economic growth and corruption followed by the problem statement. It will then provide the purpose and methodology of the thesis. The last two sections will show how the thesis contributes to the literature as well as how the whole theses is structured.

1.1 Introduction to economic growth

For many years, opinions have been divided when attempting to determine what factors affect economic growth. More so when trying to answer the question about why some nations achieve economic growth and others seem to stagnate. Early growth theorists claim that economic growth is the result of exogenous factors influencing the economy, such as the level of technological progress or the amount of labor that is available in the economy.\(^1\)

Endogenous growth theorists claim that economic growth is primarily the result of endogenous and not exogenous factors, such as investment in knowledge, innovation and human capital.\(^2\) Even though some economists think that they have discovered the formula, the true question is why do some countries grow at a constant rate year after year while others seem to stand still? Certain studies give social and political reasons for the differences while others suggest that geographical positioning or natural resources also play a part (see previous studies). The absence of a direct answer to these questions and curiosity surrounding this subject are the main reasons for writing this thesis.

1.2 Definition of economic growth

We define economic growth as an increase in the market value of the goods and services that are manufactured in a country over a certain time period. We will measure this as the change in Real GDP per capita.\(^3\)

1.3 Introduction to corruption

Corruption is a complex socio-political phenomenon that affects countries worldwide. The problem with corruption is that it demoralizes democratic institutions, contributes to

\(^1\) Solow, 1956
\(^2\) Romer, 1994
\(^3\) Statista IMF, 2014
instability within governments and in some cases can slow economic growth. In this thesis we will define corruption as the illegitimate use of public power for private benefits.\(^4\)

1.4 Problem statement

Does corruption have a significant effect on economic growth?

1.5 Purpose and methodology

The purpose of this study is to examine the effect that corruption has on economic growth. In doing this, we will use a regression analysis where the average growth of GDP per capita is our dependent variable that we measure over a period of 8 years between the years 2002-2010. Our independent variables are the perceived level of corruption, level of democracy, education (primary completion rate), initial GDP to test for conditional convergence, life expectancy and the fertility rate. The data we use will be collected from The World Bank, The Polity IV database and Transparency International.

1.6 Contribution to the literature

Most previous studies regarding corruption and economic growth use endogenous and exogenous growth theory, which often is complemented with institutional theory as the theoretical framework. In this thesis, we use a more philosophical theoretical framework by looking at principal-agent theory as well as public choice theory and how they relate to corruption. We complement this with institutional theory but instead of examining the theory on its own, we explain what role institutions play in the principal-agent theory. The collection of variables in the regression model as well as the choice of previous studies used also contributes to making this thesis unique.

1.7 Thesis structure

Section 1 will provide a short background on economic growth and corruption followed by the purpose of the study and the methods used to answer the fundamental question of the thesis. Section 2 is used to inform the reader about words that do not typically show up in everyday speech to offer an understanding of the theories presented later in the theoretical discussion. Section 3 will present earlier empirical findings regarding economic growth as well as corruption that is relevant to our subject followed by the section 4, which presents

---

\(^4\) Transparency International, 2014
theories that are appropriate for this study. Section 5 will provide the reader with deeper knowledge of corruption, basic causes and effects as well as how it is measured. Section 6 begins with an introduction of the chosen variables and expected signs for the regression analysis followed by the results. Section 7 contains results of the regression analysis where the theory as well as the analysis is evaluated followed by an answer to the problem statement. The last 2 sections contain all of the sources used to write this thesis followed by other relevant tables and figures.

2. Definitions

This section is used to inform the reader about words that do not necessarily show up in everyday speech to offer an understanding of the theories presented later in the theoretical discussion.

Red Tape

An idiom that refers to the collection or sequence of forms and procedures required for gaining bureaucratic approval for something, especially when oppressively complex and time-consuming\(^5\).

Conditional Convergence

Conditional convergence is the notion that a country converges to its own level of steady state. The further a country is from its level of steady state, the faster it will converge which means that a lower level of per capita income will generate a higher per capita growth rate. The determinants of the level of steady state are variables such as saving propensities, population growth rate, depreciation and capital stock\(^6\).

Developing Country

The definition of a developing country varies between different sources but is usually defined as a country where the vast majority lives on far less money and with fewer public services than that of other highly industrialized countries\(^7\).

\(^5\) Guriev, 2004  
\(^6\) Barro, 1996  
\(^7\) World Bank, 2014
Shirking
To avoid or neglect a duty or responsibility\(^8\).

Moral Hazard
Moral hazard is defined as a situation where one party takes on risk knowing that it is protected against the risk because someone else has agreed to carry the burden of that risk. This arises due to asymmetric information between the parties\(^9\).

Adverse Selection
A market phenomenon in which one party in a potential transaction has information that the other party lacks so that the transaction is more likely to be favorable to the party having the information, which causes market prices to be adjusted to compensate for the potential unfavorable results for the party lacking the information\(^10\).

3. Previous Studies
This section will present earlier empirical findings regarding economic growth as well as corruption that is relevant to our subject.

3.1 Previous studies about economic growth
Robert Joseph Barro concluded that for a given level of real per capita GDP, economic growth was augmented by higher initial schooling and life expectancy, lower fertility, lower government consumption, better maintenance of the rule of law, lower inflation and improvements in the terms of trade. He also stated that for given values of these and other variables, economic growth is negatively related to the initial level of real per capita GDP\(^11\). This means that growth is higher if a country begins with a lower starting level of real per capita GDP, thus Barro’s data showed patterns of conditional convergence.

He also said that Political freedom only had a weak effect on economic growth but that there where signs of a non-linear relationship. He concluded that at low levels of political rights, an expansion of these rights stimulated economic growth but once an adequate amount of democracy was installed, a further expansion reduced economic growth. Barro also

\(^8\) Bender & Lott, 1996 
\(^9\) Holmström, 1979 
\(^10\) Balakrishnan & Koza, 1993 
\(^11\) Barro, 1996
mentioned that infrastructure investments, Research and Development outlays, quality of education and the distribution of wealth and income are important factors for achieving economic growth.

3.2 Previous studies about corruption

Researchers such as Acemoglu and Verdier claim that corruption can be desirable. They stated that corruption works somewhat like a piece-rate pay for bureaucrats, which induces a more efficient provision of government services. This could provide a leeway for entrepreneurs to evade inefficient regulations such as taxes. From this perspective, corruption can work as a lubricant that smoothens operations and raises the efficiency of the economy. Their empirical analysis showed that the presence of corruption, rents for public sector employees and misallocation of resources that where tempted by the government did not imply that government intervention was counter-productive\textsuperscript{12}.

Aidt, Dutta and Sena studied the role of political accountability as a determinant of corruption and economic growth. Their empirical model identified two different government regimes defined by the quality of the political institutions and showed that the relationship between corruption and economic growth was regime specific. They used a threshold model to estimate the impact corruption had on economic growth and claimed that in a regime with high quality political institutions, corruption has a substantial negative impact on growth. In the regime with low quality institutions, corruption has no impact on growth\textsuperscript{13}.

Mendez and Sepulveda wrote a paper also claiming that the type of political regime is an important determinant of the relationship between corruption and economic growth. Their study highlighted the effects of corruption on long-run economic growth incorporating measures of political freedom as a key determinant of the relationship. Unlike other empirical results, they found evidence of a non-monotonic relationship between corruption and economic growth. They claimed that for the case of free countries, corruption is detrimental to economic growth and in countries with less political freedom, corruption proved to have a positive effect on economic growth\textsuperscript{14}.

Pak Hung Mo concluded that a 1% increase in the corruption level reduces the growth rate by 0.72% and also reduces the level of human capital and the share of private investment. He claimed that the most important channel through which corruption affected economic

\textsuperscript{12} Acemoglu & Verdier, 1998
\textsuperscript{13} Aidt, Dutta & Sena, 2007
\textsuperscript{14} Mendez & Sepulveda, 2006
growth was political instability, which accounted for 53% of the total effect. He found that corruption reduces the level of human capital and the share of private investment. In his conclusion he writes that corruption was more prevalent where other forms of institutional inefficiencies were present such as weak legislative and judicial systems as well as bureaucratic red tape.\(^{15}\)

When speaking of anti-corruption methods, Gjalt De Graaf concluded that there are not many studies on actual, individual corruption cases and that we needed more contextual research because the more we know about what causes corruption, the better we can decide which policy instrument to use to fight it. He meant that the study of several different cases would lead to additional theories on the causes of corruption. Alternative explanations and the understanding of corruption in particular countries can help us reconsider the effectiveness of existing policy instruments to use.\(^{16}\)

4. Theoretical analysis

This section will analyze principal-agent theory while considering the role institutions play in the theory. The theory’s philosophical foundation will be examined as well as the basic assumptions about economic behavior and how the theory relates to institutions and corruption. Institutional theory will also analyzed as well as Public choice theory and how it relates to corruption.

4.1 Principal-Agent theory

In economics, the principal agent theory is a theory or dilemma that one person (agent) is able to make a decision that impacts another person (principal). This dilemma exists because sometimes, the agent has motives to act in his own best interest rather than the interest of the principal. This is also known as the agency problem, which is defined as a conflict of interest where one party is expected to act in another party’s best interest. The problem occurs when the agent, who is supposed to make decisions, is naturally motivated by self-interest and that the agent’s own best interest may differ from the principals best interest. This problem arises due to asymmetric information between the agent and the principal.\(^{17}\) It has similarities to game theory because the rules can be changed to favor specific actions that are favored by the principal.

\(^{15}\) Mo, 2000
\(^{16}\) De Graaf, 2007
\(^{17}\) Laffont & Martimor, 2009
As a consequence, the central dilemma that is explored by principal-agent theorists is how to make the agent behave or act in the best interest of the principal in the case that the agent has an informational advantage over the principal and that interests differ between the two parties. The basic idea of the theory is that if both parties are assumed to be utility maximizing, then there is reason to believe that the agent will not always act in the best interest of the principal\textsuperscript{18}.

In determining the best way to go about this problem, principal-agent theory uses certain hypotheses about organizations, people and information. As mentioned earlier, the theory assumes that agents and principals will act in their own best interest to maximize their welfare and that agents hold more information than the principals. As a result, it identifies two obstacles to effective contractual performance between the two parties: moral hazard and adverse selection. In this case, moral hazard is referred when the agent doesn’t put forward agreed-upon efforts to their task, which means that the agent is shirking. Adverse selection refers to the misrepresentation of ability by the agent\textsuperscript{19}.

4.2 The importance of institutions that promote economic growth

Government institutions have the power to determine economic growth potential and distribution of resources in the future as well as shaping investment incentives in an economy. They also have a direct effect on economic growth through investments in technology as well as investment in human and physical capital. Prosperity in an economy is the result of innovation and well-protected rights, which in turn induce innovation\textsuperscript{20}. A way of emphasizing the importance of institutions that promote economic growth is by making a distinction between inclusive and extractive economic institutions.

Inclusive institutions are more likely to allow a wide-ranging market where investments in new technologies and skills significantly boost economic growth whereas extractive institutions redistribute resources to a small portion of the elite and fail to protect property rights which in turn leads to a decline in the incentives for innovation. Inclusive and extractive institutions respectively lead to inclusive and extractive politics. This means that inclusive economic institutions leads to the nation also having a broad distribution of political power.

An extractive economic institution leads to a narrow distribution of political power.

\textsuperscript{18} Jensen & Meckling, 1979
\textsuperscript{19} Eisenhardt, 1989
\textsuperscript{20} Gould & Gruben, 1996
Although extractive institutions can attain economic growth, it will not be sustainable because innovation is a requirement to reach creative destruction that will renew and improve societies\textsuperscript{21}.

In summary, it is important to have institutions that promote economic growth as well as giving individuals in an economy the opportunity and freedom to receive an education, work, invent, save money, invest, start their own businesses etc. while also having laws that protect proprietorships and copyrights.

4.3 The role of institutions in the principal-agent model

The role that institutions play in the principal-agent model will be formally represented in game form between agents and principals. To start, we assume that the agents are the policy makers. The agents are also presumed to have expertise that the principal does not, represented as information the principal would need to choose the best decision. The two parties also have different conceptions of the optimal result of the policy decision. In this case, the principal’s only instrument used to influence the agent is to identify a collection of policy decisions the agent is permitted to make and allow the agent to pick freely from them. In this very basic variant of the model, once the agent has chosen its policy, the game is over. When this model is represented in game form as such, its equilibrium would be the agent choosing its own preferred policy, which given the agents expertise, would lead to its own desired result) whenever it is within the policies that the principal has delegated. Since the two parties by assumption have different ideal outcomes, this implies that in the equilibrium, the principal does not obtain its most preferred outcome, but for at least some possible states of information, the agent does\textsuperscript{22}.

Given this asymmetric information and the policy-controlling device available to the principal, it is not possible for the principal to better hold the agent accountable to the principal’s own interests than the equilibrium indicates. If it were, then by assumption, since the principal is assumed to know its best own interests, the “equilibrium” would not in fact be equilibrium. Now given these circumstances, the principal has the power to restrict the agent to one particular policy, giving it complete control over the decision made by the agent. When looking at this model, it seems that the main goal of the principal would be to gain control over the agent, which is not the case. The goal for the principal is to get as close as possible to its preferred outcome while also making the agent utilize its expertise as much as possible,

\textsuperscript{21} Acemoglu & Robinson, 2012, p. 429
\textsuperscript{22} Gailmard & Patty, 2012
while simultaneously, staying within the interests of the principal. In this model, the principal sacrifices control in order to give the agent greater incentive to use its information. Doing this allows the agent to pursue his or her own interests.\(^{23}\)

The prime view of corruption within economics as well as political science today is the principal agent model. What corruption is modeled as is criminal conduct on behalf of some agents, which are entrusted to act on behalf of some principles. According to this view, the criminal behavior of corruption could disappear by fixing the institutional setting as well as the incentive structure.\(^{24}\)

### 4.4 Principal-agent theory and corruption

When applying the Principal Agent theory to corruption, principals have to abide to failure costs and inspection/prevention costs. They also have to minimize the sum of these costs, hindered by the agent’s concealment and diversion activities. Principals that are confronted with corruption have to minimize the sum of the costs of suppressing corruption and failure costs. In the general agency problem, the principal has to eventually turn his focus to the cost-efficiency of his inspection and prevention efforts, as well as to the fundamental problem of the indeterminacy of outcomes. In this respect there are two important components, one being the extent to which the desired outcomes are concrete and the second being whether or not agents are part of a team. From the point of view of suppressing corruption, teamwork is to be favored. This is although not in line with the general principal-agent theory. Though teamwork can tend to limit corruption, it gives way to shirking.\(^{25}\)

### 4.5 Public choice theory and corruption

In economics we define public choice theory as the use of modern economic tools to study problems in the region of political science. From a political-science perspective, this theory may be seen as the subset of positive political theory, which deals with subjects in which material interests are assumed to prevail. When talking about corruption and public choice theory, the individual is assumed to be rational, meaning that a person decides to become corrupt because the expected benefits outweigh the expected disadvantages. In other terms, public officials are corrupt because they believe that the potential benefits of being

\(^{23}\) Gailmard & Patty, 2012

\(^{24}\) Teorell, 2007

\(^{25}\) Groenendijk, 1997
corrupt exceed the potential costs\textsuperscript{26}. The advantage of Public Choice Theory is that instead of looking for general determining factors, in focuses on a particular situation of a corrupt official who calculates costs and benefits. However, in this sense, it does not take into account the larger social context, which is also the main disadvantage of the theory\textsuperscript{27}.

Public Choice theories lead to a discussion regarding corruption control, which aims to maximize the costs of corruption and minimize the benefits. The benefits of corruption can be much harder to influence so most of the focus is on the costs of corruption. Imposing steeper penalties and improving the probability of getting caught can easily increase the cost of corruption. A simple way of doing this is by implementing a comprehensive system of control based on massive gathering of information, surveillance, auditing and an aggressive enforcement of a broad selection of criminal and administrative sanctions\textsuperscript{28}.

5. Corruption

This section will provide the reader with deeper knowledge of corruption, its basic causes and effects as well as how it is measured.

5.1 Definition of corruption

The definition of corruption has several answers, but in this thesis we will define corruption as the misuse of public power for private benefit\textsuperscript{29}.

5.2 Economic theory and corruption

Economic theory has developed two different views regarding corruption. The first one believes that corruption is exogenous to the political process. This approach is set inside the framework of the principal-agent theory and is based on the assumption of asymmetric information between principals and agents. Under the assumptions that politicians are benevolent, they are uninformed about the wrongdoings of their subordinates. This approach is well developed and analytically very rich so models of corruption based on this approach are sometimes favored because they can explain a wide range of behavior of agents, including administrative corruption. Even though there are many good things about this approach, it cannot explain political corruption because one of the assumptions of this approach is that the

\begin{itemize}
\item \textsuperscript{26} Elliot, 1997, p. 31
\item \textsuperscript{27} Schinkel, 2004
\item \textsuperscript{28} Anechiarico & Jacobs, 1996, pp. 189-209
\item \textsuperscript{29} Transparency International, 2014
\end{itemize}
state is benevolent, meaning that there does not exist any probability of political corruption. Only administrative corruption can be explained and predicted. Given that the list of corrupted politicians around the world is extensive, it seems that some of the assumptions in this approach are unrealistic because political corruption cannot be explained. As stated above, the essential feature of this approach is that corruption is exogenous to the political process, meaning that corruption is not institutionalized.

The other view of corruption is that it is endogenous to the political process. This means that it is institutionalized and the level and pattern of corruption depends on the political regime in a given country. According to this view, corruption exists in the forms of bribes received by public officials, embezzlement, fraud or misuse of information for favoritism and extortion. This type of corruption is also known as political corruption. This approach provides us with the necessary grounds for understanding the relationship between the political process and corruption.

5.3 Types of corruption

When applying whichever theoretical view, three basic types of corruption are identified. Corruption for the acceleration of processes, administrative corruption and state capture.

5.3.1 Corruption for the acceleration of processes

Corruption for the acceleration of processes is the first type of corruption and means corruption for achieving or speeding-up materialization of some specific right that the citizen or legal entity is entitled to. An example is if a person bribes a civil servant in charge of issuing a passport that a briber or corruptor is entitled to. Civil servants are bribed into doing their job or doing it more quickly than they usually do, instead of not doing it at all. The frequency of this type corruption is a good indicator of the poor administrative or poor supplies of administrative services.

5.3.2 Administrative corruption

Administrative corruption is the violation of legal rules or the biased enforcement of rules. This type of corruption is the most modeled type due to its clear incentives and motives.

---

30 Begovic, 2005
31 Begovic, 2005
32 Begovic, 2005
for each economic agent and the well-defined relationship between them. This type of corruption corresponds to the principal-agent model of corruption because civil servants provide the total supply of corruption. The most significant consequence of this type of corruption is that laws and public policies are dishonorably enforced.33

5.3.3 State capture

The last form of corruption is state capture which means corruption that is aimed at changing rules and regulations that favor the interests of the corruptor. This type of corruption was developed by the World Bank to attempt to explain the reality of politics in developing countries. The general idea is that the bribing of public officials by a few oligarchs influences public policies.34

5.4 Basic causes and effects of corruption

According to mainstream economic theory, economic agents are seen as utility maximizing, which means they allocate resources to the activity that provides the greatest returns on investment. In most cases, corruption can be attributed to rent appropriation and selfish individuals seeking own personal gains through illegal activity. Complicated, unclear and unenforceable laws can also be a reason.35

5.4.1 The effect of corruption on society

Given that corruption in the public sector affects the cost and incentive structures of households and firms, economists have for a long time been interested in analyzing how corruption effects economic growth.36 Besides legal violations, corruption also undermines a free-market system by removing protection from property rights and contract enforcement, increasing the incentive for rent-seeking and creating business uncertainty.37

5.4.2 How corruption affects investors

Corruption is said to increase business uncertainty, particularly regarding the protection of property rights. This kind of uncertainty decreases the expected return for potential investors. This is especially true for foreign direct investors who compare their expected

---

33 Begovic, 2005
34 Begovic, 2005
35 Begovic, 2005
36 Swaleheen, 2011
37 Begovic, 2005
returns in different countries. Given that these investors are rational, they will invest where their expected returns are the highest\textsuperscript{38}. Since corruption decreases expected returns, investors will chose to invest in countries that are more secure. For example, if a small, corrupt nation is run by a dictator who extracts money from the country’s wealth for personal gain than the outcome will be a weak private sector and a high unemployment rate. This does not make for an attractive investment environment for multinational corporations looking to expand and certainly not encouraging for local business seeking to progress. When there is a low level of corruption and a government that acts honorably, a perception is created that it is safe to invest or do business in this country\textsuperscript{39}.

5.4.3 Rent-seeking and the effect of corruption on the free-market

It has also been determined that rent-seeking activities are closely interconnected to corruption. The foundation of rent-seeking is the enhancement of public policies to boost government intervention, thus disabling free-market operations. These public policies can intentionally be pursued since they create rent. This attracts interest from certain groups with a vested interest in generating and appropriating rent with the purpose of exploiting these public policies for various private gains. This is wrong in the context of maximization of economic efficiency and social welfare, thus making these policies not in favor of public interest\textsuperscript{40}.

5.4.4 The effect of corruption on property rights and efficient contract enforcement

Corruption violates the rule of law, which is an essential criterion for the market economy. If the rule of law does not exist, there is no protection of property rights and no efficient contract enforcement\textsuperscript{41}. This reduces the incentive for agents to make exchanges due to the inadequate support of property rights and contract enforcement. Because of the poor exchange, firms will produce the majority of their inputs internally instead of purchasing them on the market, making the social division of labor and prerequisite for specialization non-existent. Since specialization does not exist, a meaningful source of increasing economic efficiency is absent. This is how corruption reduces economic efficiency and social welfare\textsuperscript{42}.

\textsuperscript{38} Dumludag, 2012  
\textsuperscript{39} Patton, 2014  
\textsuperscript{40} Begovic, 2005  
\textsuperscript{41} World Bank, 2014  
\textsuperscript{42} Begovic, 2005
5.4.5 Utilitarianism, ethics and corruption

When assessing Utilitarianism, ethics and corruption, utilitarianism states that corruption is acceptable when it benefits more individuals in a society than it harms. Utilitarianism states that the proper course of action is always the one that maximizes an individual’s utility. In a society, this would mean that utilitarianism works towards achieving the largest amount of good for the greatest number of people. The so-called father of utilitarianism, Jeremy Bentham, stated that the human psyche was governed by two main feelings; pleasure and pain. Utilitarianism states that an individual is driven towards maximizing pleasure and minimizing pain.43

As mentioned above, utilitarianism states that corruption is satisfactory when it maximizes the pleasure of the public as a whole, but not satisfactory if it creates pain for the majority. It also states that the results of corrupt behavior are determinative of whether or not corruption can be ethically acceptable.44

To give an example, embezzlement can create a certain amount of pleasure for a single person. However, if other people suffer from the money that was stolen from them, then embezzlement can be said to cause more pain than pleasure. Yet, if an individual steals money that otherwise would have gone to a government project that already is overfunded, or if someone steals an insignificant amount of money from multiple sources, there might not be much pain inflicted. In truth, no one would probably even notice.

The problem with Utilitarianism is that there are no innate rights and wrongs. This is because the theory does not judge morality by a predetermined set of ethical values. Instead actions are “right” when they maximize the most utility for the greatest number of people and “wrong” if they create more pain than pleasure for the majority of the people. Utilitarianism measures all forms of pleasure and pain on a single scale. This measurement is also one of the main criticisms of this theory.45

5.5 Economics of corruption

Economics of corruption is the application of economic tools to analyze corruption. Thorough studies of corruption began in the 1980’s and since the new millennium; Transparency International has published data called the Corruptions Perceptions Index, which ranks countries by their perceived level of corruption. This is determined by opinion

43 Sandel, 2009, p. 7
44 Huang, 2012
45 Sandel, 2009, p. 23
surveys and expert assessments. According to the CPI, corruption is defined as the misuse of public power for private benefit. The CPI ranks 176 countries on a scale from 0-100 where 0 is highly corrupt and 100 is very clean. The CPI measures perception of corruption because it is problematic when attempting to measure absolute amounts of corruption\textsuperscript{46}. When you compare the most corrupt nations with the least corrupt nations, you will find that the least corrupt nations are generally large economies. Looking at data from the 2013 CPI, 19 of the 21 countries with the highest corruption have an annual GDP under $100 billion\textsuperscript{47}. Seeing what is written above, it is not very hard to believe that a country with a great deal of corruption is also less likely to exhibit economic growth and a flourishing economy.

5.5.1 Validity of the CPI

In 2002, Paul G. Wilhelm publishes “International Validation of the corruption Perceptions Index” which showed a very strong significant correlation between the CPI and two other alternative measurement of corruption: Black market activity and overabundance of regulation. All of these three measurements also showed a very strong correlation with real GDP per capita\textsuperscript{48}.

6. Empirical analysis

This section begins with an introduction of the chosen variables and the regression model followed by the explanation of the variables and the expected signs. The last section contains the results.

6.1 Introduction to the regression model and variables

For the empirical analysis we will use a linear regression model. To highlight the elements that vary between countries, a cross-sectional regression will be used. The independent variable in the regression model is average GDP per capita growth ($GDP_{Growth}$). The independent variables are perceived level of corruption (CPI), primary completion rate (EDU), level of democracy (DEM), fertility rate (FER), life expectancy (LIFE) and Initial GDP ($GDP_{Initial}$). The experimental variable in this case is the perceived level of corruption (CPI) and is the only variable that will change. The rest of the independent variables are explanatory and are expected to have a significant effect on GDP growth.

\textsuperscript{46} Transparency International, 2014
\textsuperscript{47} Transparency International, 2014
\textsuperscript{48} Wilhelm, 2002
variables are control variables, which are held constant in order to assess the relationship between the independent variable and the experimental variable. This will then of course be followed by the results of the regression model.

6.2 Regression Model

\[ GDP_{Growth} = \alpha + \beta_1 CPI + \beta_2 EDU + \beta_3 DEM + \beta_4 FER + \beta_5 LIFE + \beta_7 GDP_{Initial} + \epsilon \]

6.3 Explanation of variables and expected signs

\[ GDP_{Growth} = \text{Average GDP per capita growth} \]
\[ \alpha = \text{Intercept} \]
\[ \beta_n = \text{Correlation coefficient} \]
\[ CPI = \text{perceived level of corruption} \]
\[ EDU = \text{Primary completion rate} \]
\[ DEM = \text{Level of democracy} \]
\[ FER = \text{Fertility rate} \]
\[ LIFE = \text{Life expectancy} \]
\[ GDP_{Initial} = \text{Initial GDP} \]
\[ \epsilon = \text{Error term} \]

**GDP per capita growth**

The dependent variable used in our model is GDP per capita growth. GDP per capita growth is measured as the annual percentage growth of GDP per capita. We used this variable because it is a measurement of national income growth, which makes it an appropriate dependent variable.

**Perceived level of corruption**

The perceived level of corruption is taken from Transparency International. The Corruption Perceptions Index (CPI) is defined as the misuse of public power for private benefit. The CPI ranks 176 countries on a scale from 0-10 where 0 is highly corrupt and 10 is
very clean. Earlier empirical results have proved that the CPI and economic growth are negatively correlated and so we expect the sign to be positive.

**Level of education**

We measure years of education as the total primary completion rate. This is the number of new entrants in the last grade of primary education, regardless of age, which is expressed as a percentage of the total population. This indicator is also known as the “gross intake rate to the last grade of primary.” The ratio can sometimes exceed 100% due to that over or under-aged people can enter primary school late or early and also repeat grades. One problem we face with this measurement is that we cannot measure the quality of education. Barro claimed that with respect to education, growth is positively related to the starting level of average years of school attainment of adult males at the secondary and higher levels. It would probably be better to measure the quality of education rather than the quantity. However, this data is difficult to obtain in less developed countries. We expect this sign to be positive because a higher level of education should have a positive effect on economic growth.

**Level of democracy**

We measure the level of democracy as the overall polity score from the Polity IV dataset, which is calculated by subtracting an autocracy score from a democracy score. It is a measurement of a country’s democratic and free nature. -10 is the lowest value and 10 is the highest value. We believe that the sign should be positive because a higher level of democracy should presumably correlate with a higher level of economic growth. Barro claimed that the overall effect of democracy on growth is weak and that there is a suggestion of a non-linear relationship in which more democracy enhances growth at low levels of political freedom but reduces growth when a moderate level of freedom already has been achieved.

**Fertility rate**

Fertility rate is measured as the average amount of children per woman. We expect this

---

49 Transparency International, 2014
50 Mo, 2000
51 World Bank, 2014
52 Barro, 2000
53 Polity IV, 2014
54 Barro, 1996
sign to be negative because we believe that the more children a woman has, the less she can work hence, society misses out on means of production. Barro provided empirical evidence, which verified that lower fertility rates stimulate economic growth.  

Life expectancy at birth

Life expectancy at birth is the expected number of years that a newborn baby will live. We expect this sign to be positive because a longer life means a larger labor force in the country, which consequently should leads to a higher level of production and economic growth. However, Acemoglu and Johnson claimed that life expectancy has a positive but not very large effect on economic growth.  

Initial GDP per capita

The main reason for the inclusion of this variable is to test for conditional convergence. This means that a lower initial level of GDP should mean more rapid growth, also known as the catch-up effect. We expect this sign to be negative because a higher initial GDP should have a negative effect on economic growth. Barro concluded that the general notion of conditional convergence was strongly supported in his empirical results.  

---

55 Barro, 1991
56 Acemoglu & Johnson, 2007
57 Barro, 1996
6.4 Regression variables, sources, expected signs and results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Source</th>
<th>Expected sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>( GDP_{\text{Growth}} )</td>
<td>GDP per capita growth</td>
<td>World Bank</td>
<td>Dependent Variable</td>
</tr>
<tr>
<td>CPI</td>
<td>Perceived corruption</td>
<td>Transparency International</td>
<td>+</td>
</tr>
<tr>
<td>EDU</td>
<td>Level of education</td>
<td>World Bank</td>
<td>+</td>
</tr>
<tr>
<td>DEM</td>
<td>Level of democracy</td>
<td>Polity IV</td>
<td>+</td>
</tr>
<tr>
<td>FER</td>
<td>Fertility rate</td>
<td>World Bank</td>
<td>-</td>
</tr>
<tr>
<td>LIFE</td>
<td>Life expectancy</td>
<td>World Bank</td>
<td>+</td>
</tr>
<tr>
<td>GDP_{\text{Initial}}</td>
<td>Initial GDP</td>
<td>World Bank</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 1: Overview of regression variables, sources and expected signs

Dependent variable: \( GDP_{\text{Growth}} \) (Average 2002-2010) \( N=41 \)

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. error</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>3.94471</td>
<td>4.10275</td>
<td>0.9615</td>
</tr>
<tr>
<td>CPI</td>
<td>0.0111007</td>
<td>0.379292</td>
<td>0.02927</td>
</tr>
<tr>
<td>EDU</td>
<td>0.0183724</td>
<td>0.0260728</td>
<td>0.7047</td>
</tr>
<tr>
<td>DEM</td>
<td>-0.164744</td>
<td>0.0648542</td>
<td>-2.540</td>
</tr>
<tr>
<td>FER</td>
<td>-0.689651</td>
<td>0.289255</td>
<td>-2.384</td>
</tr>
<tr>
<td>LIFE</td>
<td>0.0245528</td>
<td>0.0598192</td>
<td>0.4104</td>
</tr>
<tr>
<td>GDP_{\text{Initial}}</td>
<td>-0.00046976</td>
<td>0.000277982</td>
<td>-1.690</td>
</tr>
</tbody>
</table>

\( R^2 \) | 0.444700 | F-statistic | 4.538025  |
| \( R^2_{\text{Adj.}} \) | 0.346706 | P-value (F) | 0.001762  |

Table 2: Regression results. Notes: ***, ** and * represent significance at the 1%, 5% and 10% levels respectively.
6.5 Results of regression analysis

According to our results, corruption does not have a significant effect on economic growth. This can be seen in the p-values and t-values in the table above which tells us that the coefficient is not significantly different from zero. The model does not have a very good fit, which is evident when looking at the low $R^2$ values.

When using the significance level of 5%, the variables that show a significant effect on economic growth are the level of democracy and the fertility rate. This can once again be seen in the table above by looking at the significant t-values and p-values. By looking at the correlation matrix (table 4) and the scatterplots found in the appendix (figures 4 and 5), the relationship is also evident, with both of these variables exhibiting significant correlation with economic growth.

The variable Democracy exhibited a negative sign, which was not in line with our expectations. We believed that a higher level of democracy should lead to higher economic growth. Some empirical results have exhibited similar results and claim that countries with an authoritarian political system are predicted to grow at least as fast, if not faster than democracies. They state that democracy may have some positive, indirect effects on economic growth such as greater stability or more extensive property and copyright laws but that the econometric results suggest that these positives are balanced by negatives such that the net effect of democracy on economic growth over the last five decades is negative or null\(^{58}\).

The Variable Fertility received a significant result and the sign was in line with our expectations and earlier empirical findings such as Barro who provided empirical evidence verifying that lower fertility rates augment economic growth\(^ {59}\). This is in line with exogenous growth theory as fertility decisions are seen as exogenous factors that affect economic growth\(^ {60}\).

The variable GDP\(_{\text{Initial}}\) does not show a significant result, which means that the conditional convergence theory is not supported. However, with a slightly larger sample, or the omission of certain variables that correlate with Initial GDP, the conditional convergence theory should be supported when using the significance level of 10%. The sign of the coefficient matched our expectations.

The coefficient of education received an insignificant result and we feel that it is necessary to emphasize one shortcoming of the data. Education is set as the primary

\(^{58}\) Gerring, 2005
\(^{59}\) Barro, 1991
\(^{60}\) Barro, 1991
completion rate, expressed in percent of the population, which only measures the number of new entrants in the last grade of primary education. It does not measure the quality of education, which has been shown to have a significant effect on economic growth. However, the estimated coefficient is positive which is in line with Schumpeterian growth theory which states that increased education leads to an increase in technological progress which in turn leads to economic growth.

Life expectancy does not have a significant effect on economic growth. The sign matched our expectations, which is in line with earlier empirical findings such as Acemoglu, and Johnson who found that life expectancy has a positive but weak effect on economic growth.

Even if most of the coefficients are not significant, 5 out of 6 signs of the coefficients were as expected which is in line with theories and other previous empirical results. The only sign that wasn’t in correspondence to our expectations was the level of democracy, which exhibited a negative sign. The insignificant results can be the cause of multicollinearity. The correlation matrix in table 4 in the appendix shows us some significant correlations, which is evidence of multicollinearity in the regression model.

7. Conclusion

This section contains the results of the regression analysis where the theory as well as the analysis is evaluated followed by an answer to the problem statement and concluding remarks.

7.1 Results of regression and concluding remarks

According to our empirical results, corruption does not seem to have a significant effect on economic growth. The insignificant results are partly due to multicollinearity, which exists in our regression model. This can be seen in table 3 in the appendix, which is OLS estimation when omitting the variables that correlated the most with the perceived level of corruption, which were Democracy, Life expectancy and Initial GDP. The perceived level of corruption now receives a significant result and a negative sign, which is in line with some empirical researchers that find it plausible that corruption can augment economic growth at some
levels. The fact that we are only working with developing countries could support this claim.

In our first OLS estimation, we received a positive sign for the coefficient CPI, which was in line with our expectations because earlier empirical researchers, such as Pak Mo Hung have proved that corruption is detrimental to economic growth by reducing the level of human capital and the share of private investment. This claim can be supported because in theory, corruption tends to damage innovative activities because innovators are in need of legal protection such as permits, import quotas or certain contracts. The demand for these government-supplied goods are high and inelastic making them a primary target for corruption. Additionally, innovators without any established connections and lobbies are subject to bribes and other forms of expropriations. Unlike established producers, innovators are usually credit-constrained which means that they are unlikely to have the money to pay for bribes. This is what reduces the level of private investments as well as the supply of producible inputs in the long run. This will lead to that people’s talents and effort will be allocated towards rent-seeking activities instead of productive investments such as the accumulation of capital and knowledge.

Schumpeterian growth theory tells us that technological progress is unlikely to occur without successful innovations meaning that the government and its power to enforce laws play a big role in economic growth. As explained above, corruption undermines the free-market system by removing protection from property rights and contract enforcement, increasing the incentive for rent-seeking and creating business uncertainty, which also means a lower probability for successful innovations.

In the theoretical analysis we looked at the principal-agent model and what role institutions play in that model. We represented the interaction between agents and principals in game form. Given this game representation, principal agent theory seems to be a flexible approach when attempting to interpret the effects of institutional actions on accountability of policy makers.

According to our empirical results, corruption exists where other forms of institutional inefficiencies also are prevalent. This tells us that there exists an incentive for being corrupt. Like public choice theory tells us regarding corruption; public officials are corrupt because

---

63 Leff, 1964  
64 Mo, 2000  
65 Murphy, Schleifer & Vishny, 1993  
66 Mo, 2000  
67 Gailmard & Patty, 2012
they believe that the potential benefits of being corrupt exceed the potential costs. This must be of concern for a nation where the public people depend on the government who use their entrusted power for private gains. Corruption hurts everyone who depends on people in a position of authority. The major question these countries face for the future is will the nations available resources be subject to creating wealth or subject to the redistribution of wealth? The decision lies in the hands of the nation.

---

68 Elliot, 1997, p. 31
Bibliography


**Electronic Sources**


**Statistical Sources**


World Bank (2014). *Primary Completion Rate, Total (% of Relevant Age Group).* Accessed 21/05/14
http://data.worldbank.org/indicator/SE.PRM.CMPT.ZS
Appendix

<table>
<thead>
<tr>
<th></th>
<th>COEFFICIENT</th>
<th>STD. ERROR</th>
<th>T-RATIO</th>
<th>P-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONST</td>
<td>7,02989</td>
<td>3,12987</td>
<td>2.246</td>
<td>0.308</td>
</tr>
<tr>
<td>COR</td>
<td>-0.615681</td>
<td>0.298368</td>
<td>-2.063</td>
<td>0.0461**</td>
</tr>
<tr>
<td>EDU</td>
<td>0.006444</td>
<td>0.0272400</td>
<td>0.2366</td>
<td>0.8143</td>
</tr>
<tr>
<td>FER</td>
<td>-0.676739</td>
<td>0.294926</td>
<td>-2.295</td>
<td>0.0275**</td>
</tr>
<tr>
<td>R²</td>
<td>0.238939</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: OLS estimation with omitted variables. The variables omitted are Democracy, Life expectancy and Initial GDP. COR now receives a significant result. Notes: ***, ** and * represent significance at the 1%, 5% and 10% levels respectively.

<table>
<thead>
<tr>
<th>GDP Growth</th>
<th>CPI</th>
<th>EDU</th>
<th>DEM</th>
<th>FER</th>
<th>LIFE</th>
<th>GDP Initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP Growth</td>
<td>1</td>
<td>-0.3053</td>
<td>0.2106</td>
<td>-0.4984</td>
<td>-0.3858</td>
<td>-0.0370</td>
</tr>
<tr>
<td>CPI</td>
<td>-0.3053</td>
<td>1</td>
<td>-0.0573</td>
<td>0.3688</td>
<td>0.0184</td>
<td>0.5029</td>
</tr>
<tr>
<td>EDU</td>
<td>0.2106</td>
<td>-0.0573</td>
<td>1</td>
<td>0.0835</td>
<td>-0.4284</td>
<td>0.3804</td>
</tr>
<tr>
<td>DEM</td>
<td>-0.4984</td>
<td>0.3688</td>
<td>0.0835</td>
<td>1</td>
<td>0.0745</td>
<td>0.2899</td>
</tr>
<tr>
<td>FER</td>
<td>-0.3858</td>
<td>0.0184</td>
<td>-0.4284</td>
<td>0.0745</td>
<td>1</td>
<td>-0.3722</td>
</tr>
<tr>
<td>LIFE</td>
<td>-0.0370</td>
<td>0.5029</td>
<td>0.3804</td>
<td>0.2899</td>
<td>-0.3722</td>
<td>1</td>
</tr>
<tr>
<td>GDP Initial</td>
<td>-0.3077</td>
<td>0.6211</td>
<td>0.1653</td>
<td>0.4137</td>
<td>-0.2715</td>
<td>0.5820</td>
</tr>
</tbody>
</table>

Table 4: Correlations, using N=41. 5% critical value (two-tailed) = 0.3081. Significant Correlations are bold.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Std. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP Growth</td>
<td>3,6878</td>
<td>3,6000</td>
<td>14,500</td>
<td>-0,40000</td>
<td>2,5070</td>
</tr>
<tr>
<td>CPI</td>
<td>3,2463</td>
<td>2,9000</td>
<td>7,2000</td>
<td>1,8000</td>
<td>1,2071</td>
</tr>
<tr>
<td>EDU</td>
<td>89,932</td>
<td>96,500</td>
<td>105,90</td>
<td>51,700</td>
<td>14,630</td>
</tr>
<tr>
<td>DEM</td>
<td>4,3122</td>
<td>7,0000</td>
<td>10,000</td>
<td>-7,0000</td>
<td>5,6478</td>
</tr>
<tr>
<td>FER</td>
<td>2,8415</td>
<td>2,5000</td>
<td>6,5000</td>
<td>1,3000</td>
<td>1,3493</td>
</tr>
<tr>
<td>LIFE</td>
<td>68,710</td>
<td>71,400</td>
<td>78,600</td>
<td>47,800</td>
<td>7,6586</td>
</tr>
<tr>
<td>GDP Initial</td>
<td>2048,3</td>
<td>1479,5</td>
<td>7032,0</td>
<td>238,16</td>
<td>1705,9</td>
</tr>
</tbody>
</table>
Table 5: Descriptive statistics

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP Growth</th>
<th>CPI</th>
<th>EDU</th>
<th>DEM</th>
<th>FER</th>
<th>LIFE</th>
<th>GDP Initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>5.5</td>
<td>2.8</td>
<td>97.9</td>
<td>8.3</td>
<td>1.9</td>
<td>76.2</td>
<td>1363.3</td>
</tr>
<tr>
<td>Argentina</td>
<td>4.6</td>
<td>2.8</td>
<td>102.6</td>
<td>8</td>
<td>2.3</td>
<td>74.9</td>
<td>2711.9</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>14.5</td>
<td>2.1</td>
<td>93.5</td>
<td>-7</td>
<td>1.9</td>
<td>69.2</td>
<td>763.1</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>4.5</td>
<td>1.8</td>
<td>103.7</td>
<td>3.1</td>
<td>2.6</td>
<td>67.9</td>
<td>347.2</td>
</tr>
<tr>
<td>Belarus</td>
<td>8.3</td>
<td>2.9</td>
<td>99.9</td>
<td>-7</td>
<td>1.3</td>
<td>69.5</td>
<td>1479.5</td>
</tr>
<tr>
<td>Brazil</td>
<td>2.8</td>
<td>3.7</td>
<td>98.4</td>
<td>8</td>
<td>2</td>
<td>72</td>
<td>2810.7</td>
</tr>
<tr>
<td>Chile</td>
<td>2.9</td>
<td>2.2</td>
<td>57.4</td>
<td>-4</td>
<td>1.9</td>
<td>52.4</td>
<td>648.3</td>
</tr>
<tr>
<td>Cote d'Ivoire</td>
<td>-0.4</td>
<td>7.2</td>
<td>58.5</td>
<td>9.6</td>
<td>5</td>
<td>78.3</td>
<td>4487.2</td>
</tr>
<tr>
<td>Cameroon</td>
<td>0.6</td>
<td>3.8</td>
<td>105.9</td>
<td>7</td>
<td>5.3</td>
<td>72.5</td>
<td>2376.1</td>
</tr>
<tr>
<td>Colombia</td>
<td>2.8</td>
<td>4.7</td>
<td>94.2</td>
<td>10</td>
<td>2.5</td>
<td>78.6</td>
<td>4114.6</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>3</td>
<td>2.1</td>
<td>92.1</td>
<td>0</td>
<td>2</td>
<td>47.8</td>
<td>688.9</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>4.2</td>
<td>3.1</td>
<td>89.5</td>
<td>8</td>
<td>2.7</td>
<td>71.9</td>
<td>2973.7</td>
</tr>
<tr>
<td>Ecuador</td>
<td>2.3</td>
<td>2.3</td>
<td>100.9</td>
<td>5.7</td>
<td>2.8</td>
<td>74.8</td>
<td>2191.0</td>
</tr>
<tr>
<td>Egypt</td>
<td>3.3</td>
<td>3.1</td>
<td>98.6</td>
<td>-4</td>
<td>3</td>
<td>69.7</td>
<td>1286.2</td>
</tr>
<tr>
<td>Ghana</td>
<td>3.4</td>
<td>3.7</td>
<td>74.4</td>
<td>7.6</td>
<td>4.3</td>
<td>59.1</td>
<td>311.6</td>
</tr>
<tr>
<td>Guatemala</td>
<td>0.9</td>
<td>2.7</td>
<td>75.9</td>
<td>8</td>
<td>4.3</td>
<td>69.9</td>
<td>1765.9</td>
</tr>
<tr>
<td>Hungary</td>
<td>2</td>
<td>5</td>
<td>97</td>
<td>10</td>
<td>1.3</td>
<td>73.1</td>
<td>6535.3</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3.9</td>
<td>3.1</td>
<td>98</td>
<td>9</td>
<td>2.5</td>
<td>64.4</td>
<td>486.6</td>
</tr>
<tr>
<td>India</td>
<td>6.3</td>
<td>2.3</td>
<td>94.4</td>
<td>7.6</td>
<td>2.8</td>
<td>69.1</td>
<td>909.9</td>
</tr>
<tr>
<td>Jamaica</td>
<td>0.3</td>
<td>3.5</td>
<td>97.5</td>
<td>9</td>
<td>2.4</td>
<td>71.8</td>
<td>3716.3</td>
</tr>
<tr>
<td>Jordan</td>
<td>4</td>
<td>5</td>
<td>100</td>
<td>-2.4</td>
<td>3.7</td>
<td>72.8</td>
<td>1901.6</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>6.7</td>
<td>2.4</td>
<td>102.6</td>
<td>-6</td>
<td>2.4</td>
<td>66.7</td>
<td>1658.0</td>
</tr>
<tr>
<td>Kenya</td>
<td>1.4</td>
<td>2.1</td>
<td>88.9</td>
<td>7.7</td>
<td>4.8</td>
<td>55.9</td>
<td>398.4</td>
</tr>
<tr>
<td>Lithuania</td>
<td>5.7</td>
<td>4.8</td>
<td>101.2</td>
<td>10</td>
<td>1.4</td>
<td>71.9</td>
<td>4113.8</td>
</tr>
<tr>
<td>Morocco</td>
<td>3.6</td>
<td>4.9</td>
<td>76.3</td>
<td>4</td>
<td>2.5</td>
<td>73.8</td>
<td>4130.7</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.8</td>
<td>3.5</td>
<td>95.3</td>
<td>8</td>
<td>2.4</td>
<td>75.7</td>
<td>7032.0</td>
</tr>
<tr>
<td>Malaysia</td>
<td>3.2</td>
<td>3.4</td>
<td>96.9</td>
<td>-6</td>
<td>2.2</td>
<td>69.3</td>
<td>1362.5</td>
</tr>
<tr>
<td>Nigeria</td>
<td>4.1</td>
<td>2.1</td>
<td>74</td>
<td>4</td>
<td>6</td>
<td>49.2</td>
<td>457.5</td>
</tr>
<tr>
<td>Pakistan</td>
<td>2.6</td>
<td>2.3</td>
<td>60.6</td>
<td>-0.8</td>
<td>3.7</td>
<td>65.3</td>
<td>483.0</td>
</tr>
<tr>
<td>Philippines</td>
<td>3.1</td>
<td>2.1</td>
<td>93.6</td>
<td>7.9</td>
<td>3.4</td>
<td>71.4</td>
<td>1135.3</td>
</tr>
<tr>
<td>Poland</td>
<td>4.3</td>
<td>2.5</td>
<td>96.5</td>
<td>8</td>
<td>1.3</td>
<td>67.6</td>
<td>1005.0</td>
</tr>
<tr>
<td>Paraguay</td>
<td>2.1</td>
<td>4.1</td>
<td>93.9</td>
<td>10</td>
<td>3.2</td>
<td>75.2</td>
<td>529.9</td>
</tr>
<tr>
<td>Russia</td>
<td>5.2</td>
<td>2.4</td>
<td>96.7</td>
<td>5.1</td>
<td>1.4</td>
<td>66.7</td>
<td>2375.2</td>
</tr>
<tr>
<td>Senegal</td>
<td>1.3</td>
<td>3.2</td>
<td>80.9</td>
<td>7.6</td>
<td>5.2</td>
<td>61</td>
<td>513.4</td>
</tr>
<tr>
<td>Thailand</td>
<td>4</td>
<td>3.5</td>
<td>51.7</td>
<td>4.7</td>
<td>1.5</td>
<td>72.6</td>
<td>1988.7</td>
</tr>
<tr>
<td>Turkey</td>
<td>3.7</td>
<td>3.8</td>
<td>98.9</td>
<td>7</td>
<td>2.2</td>
<td>72.7</td>
<td>3576.2</td>
</tr>
<tr>
<td>Uganda</td>
<td>4.1</td>
<td>2.5</td>
<td>57.9</td>
<td>-2</td>
<td>6.5</td>
<td>53.7</td>
<td>238.2</td>
</tr>
<tr>
<td>Ukraine</td>
<td>4.7</td>
<td>2.5</td>
<td>101</td>
<td>6.4</td>
<td>1.3</td>
<td>68.5</td>
<td>879.5</td>
</tr>
<tr>
<td>Uruguay</td>
<td>3.7</td>
<td>6.3</td>
<td>99.4</td>
<td>10</td>
<td>2.1</td>
<td>75.9</td>
<td>4089.1</td>
</tr>
<tr>
<td>Venezuela</td>
<td>1.7</td>
<td>2.2</td>
<td>93.2</td>
<td>3.7</td>
<td>2.6</td>
<td>73.4</td>
<td>3666.7</td>
</tr>
</tbody>
</table>
Table 6: Average values of all countries used in the empirical analysis

| Country | 5.5 | 2.6 | 97.4 | -7 | 1.9 | 74.7 | 477.1 |

Figure 3: Scatterplot showing relationship between the perceived level of corruption and GDP per capita growth. The scatterplot shows a correlation of -0.3053.
Figure 4: Scatterplot showing the relationship between the level of democracy and GDP per capita growth. The scatterplot shows a significant relationship of -0.4984.

Figure 5: Scatterplot showing the relationship between the fertility rate and GDP per capita growth. The scatterplot shows a significant correlation of -0.3858.

Figure 6: Scatterplot showing the perceived level of corruption and the level of democracy. The equation is $y = 1.7255x - 1.2894$. 
Figure 6: Scatterplot showing the relationship between the perceived level of corruption and the level of democracy. The scatterplot shows a significant correlation of 0.3688.