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THESIS FOR THE DEGREE OF MASTER

MGE – EUROPEAN MASTER IN PUBLIC ECONOMICS AND PUBLIC FINANCE

Essays on Corruption and Economic Growth: A Theoretical and Empirical Evidence

presented and defended

the 7th of June 2011

by

Kouramoudou Kéïta

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Abstract

The goal of this Master's Thesis is to explain the determinants and implications of corruption phenomenon. With this intention, initially, it reviews the literature on corruption. Then it develops an empirical study which tries to test three theoretical assumptions which are: the impact of corruption on economic growth; the contribution of corruption's transmission channels; the effect of corruption on the composition of government expenditures. Panel data, relative to twenty-three OECD countries, then to thirty-five ones, with random and GLS estimators are used. In addition, for a question of reliability and robustness of the results, cross-country regressions are also implemented.

At the conclusion of the various tests, it is clearly highlighted that the empirical results perfectly corroborate the theories. Thus, it appears that corruption reduces economic growth. This influence is made possible thanks to certain determinant variables. In addition, corruption has also an impact on the composition and the level of public expenditures.

To My Father, more than ever

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General Introduction

Corruption is bad not because money and benefits change hands, and not because of the motives of participants, but because it privatizes valuable aspects of public life, bypassing processes of representation, debate, and choice.

<div align="right">Dennis F. Thompson, (1993)</div>

C orruption is now a disease for democracy and developing nations. Despite being under tremendous criticism and accusations, it does not back either. Indeed, its tendency seems to rise faster than the dynamics implemented to neutralize it. Corruption has many aspects and concerns systematically all the countries of the world. However it tends to take a larger share in the countries in sub-Saharan Africa, the newly industrialized countries of Asia, Latin America and the countries forming the block formerly communist.

For over three decades, numerous studies, both theoretical and empirical studies have been conducted to provide answers to the problem of corruption. On arrival, these studies suggest the varied viewpoints on the issue. The diversity of corruption makes it a complex and difficult concept to define. It depends on: who is the source of corruption, to those who benefit from it, to those implement it, to who are players. It also includes several other acceptances such as: payment of bribes against favors, the subtle political and economic practices through which the politician uses his power for personal purposes, diversion or theft of public funds. Its causes are equally diverse, and to better understand, it is necessary to refer to the degree of civility and ethics of individuals. The historical background, traditional practices, the economic system and institutional organization are also factors that play fully in

the identification of corruption. However today, the elements that emerge most often in studies over many years are undoubtedly the economic and political systems. These appear to be elements that support the full entrenchment of corrupt habits. While in developed countries it is nurtured through a flaw of democracy. Its consequences are especially devastating for most developing countries. For example, they have a tremendous impact on the functions of government in these countries. In the recent past, awareness on the consequences of corruption has led to political reforms in Italy, the change of government in Japan, Indonesia, Peru, Philippines, and very recently in Republic of Guinea, Tunisia and Egypt. According to a report of Transparency International: *"Corruption is one of the greatest challenges of the contemporary world. It undermines good governance, systematically distorts public policy, leads to a misallocation of resources, deteriorating the private and public sector development and especially affects the poor"*. The problem of corruption fundamentally challenges the disciplines of Political and Economic Sciences. The theoretical and empirical surveys made under the two prisms are revealing. They emphasize the important role of *"Powers"* in the evolution of corruption in the city. On the other hand, they promote the accurate identification of various channels through which corruption is transmitted. These range from investments, openness, education and political instability. Thus, corruption has become a vast field of research in Political Sciences and especially in economics, though in the latter some questions remained unresolved.

This Master's Thesis will be part of the dynamics of work previously performed. It comprises two main parts. The first part reviews the vast literature on rent-seeking behaviors, their determinants and implications. The second part is a typical empirical study. At this level and on the basis of various econometric models, this paper intends firstly, to highlight the impact of corruption on economic growth, and then it will try to measure and analyze accurately the contribution of corruption's transmission channels. The thesis will finally focus on the relation between corruption and the structure of government expenditures.

Part I

Review of Literature on Corruption

Part I

Review of Literature on Corruption

The Prophet of Allah (peace be upon him) cursed the one who bribes as well as one who takes bribe.

Sunan Abu-Dawud: Book 24, Number 3573. Narrated Abdullah IbnAmrIbn al-'As

1. Definitions

The World Bank report (1997: 1), relative to world growth, stated that:*"an effective state is vital for the provision of goods and services –and the rules and institutions – that allow markets to flourish and people to lead healthier, happier lives. Without it, sustainable development, both economic and social is impossible"*. The issue of corruption appears to be another argument in favor of Keynesian theories about the importance of the state in economic development. Corruption thus set itself up as a potential obstacle to developing countries in the effective provision of public services to emerging markets and individual development. Thus, economic reforms and social changes needed within the state.

Conventionally, corruption is defined as the opportunistic behavior of a clerk of the State exercising its prerogative of public authority for personal purposes. Colin Nye (1967: 417) in turn incorporates broader aspects. He said there is corruption committed whenever a public official of the State differs from the role of defending the public interest, supposed to be his, to take a look singularly individualistic (personal, close family), pecuniary or gain statute, violate the principles against some forms of abuse of authority to reach an end concerned. This view of corruption is similar to that given by Khan (1996: 12). According to the World Bank, corruption is an abuse of public authority for private benefit. According to Bayley (2005), two key issues can hold our attention in this range of definitions. We realize they are crucial in the identification of the phenomenon of corruption.

The first element is the private interest as income derived from the bribery. This determines the level of corruption. In economic philosophy, it is argued that individual behavior is more noticeable vis-à-vis its own interest. This is true also evident in practice. However, one could wonder what value these private interests have to encourage corruption because it may well be that the state official (the bureaucrat) is selfless and not selfish. Thus the concept of private interest in the context of corruption seems somewhat ambiguous, but nevertheless very important. What happens for example when it awards a contract employee of a public project undertaken against bribes? It is definitely a case of corruption. On the contrary, that happens if instead of bribe, the bureaucrat requires that the company hired his brother or request financial support for his political party? The private interest is not limited solely to monetary gain. It goes well beyond these details. As long as the bureaucrat deems the consideration (whatever that is) sufficient for the service it sells. But in the economic literature, there are several types of corruption based counterparts received by the employee. Further, this Master's Thesis will review this body of concepts.

The second element involves the abuse of bureaucrat's authority. At this level, the famous "Principal-agent" model allows to better understand the opportunistic behavior of bureaucrats. Though this model has many implications in Economics, including Industrial Economics or Economics of Contracts, however, it remains the foundation of many theories of *Public Choice* [Arrow (1985), Stiglitz (1987), Grossman (1983), Rocaboy, Feld, and Josselin (1995)]. In corruption setting, the official is the agent. It is mandated by the principal who is the state (more broadly, voters) to make appropriate decisions in his place and defend its interests. The only downside is that there is information asymmetry between the bureaucrat (agent) and his employer (principal). In other words, it is not always possible for voters to check the moral quality of the agent *exante*. Such is the dilemma! According to Aidt (2003), corruption can be likened to a contract relating to transaction costs. That is, a parallel market created by the staff who has a comparative advantage relative to the economically valuable legal market. It saves time, compared to the second. From this perspective, corruption can be a source of economic efficiency. The legal market in turn, submits to institutional procedures deemed slow and exacting. Williamson's survey on transaction costs argue that any economic transaction costs generated previously. However some operations that take place in the market generate high transaction costs. Thus agents may seek to minimize that price through

alternative arrangements. Corruption may indeed be a suitable option for the customer who is not always endowed with *"bounded rationality"*.

A common feature of these different meanings of corruption concept is the constant involvement of the government through its officials. In the market of corruption, these are the demander (demand side). The supply side also deserves special attention in the theory of corruption. But very few studies devoted to it. It consists to all the other components of society: private enterprises, NGOs internal or external etc. Corruption does not imply that state officials. It also exists in private companies, associations, groups, between people in managing their daily affairs, without any involvement of any public structure whatsoever. However, theories on rent-seeking behavior tend to focus on the only forms involving state officials. However, the intra-societal form is nevertheless widespread and determines the overall integrity and moral ethics of society. It identifies various forms such as mafia practices, cheating, fraud, rigging, lobbying, etc.

2. Types of Corruption

Since the 90s, every economic or political crisis occurred has led to criminalize corruption or a broader governance failure. This failure in turn has negatively influenced the collective choices and dramatically reduces economic efficiency. But to address these shortcomings, it is essential to know their typology to identify at first. This step is crucial as it allows then to answer many other questions including: how each type works? Who are the actors? What are their goals? What are the causes and consequences? What measures are appropriate?

In this section, therefore, this paper conducts a detailed description of different forms of corruption encountered in the literature. At this level, it will try to focus especially on the first three questions raised in the previous paragraph. The last two, all equally important as the other sections will be developed in future. Finally, the paper will try to give illustrations of each of the actual trends in order to measure precisely the issues. In the literature, there is essentially political corruption (Political Corruption) and bureaucratic (Bureaucratic corruption). The first refers to the policy makers while the latter refers to the rent-seeking operated at low levels, i.e. by bureaucrats who are simply agents for tasks to execute the decisions.

2.1. Political Corruption or *"Grand Corruption"*

Political corruption refers to the form of corruption in political circles across the top of the state, hence the name Anglo-Saxon *"grand corruption"*. Thus unlike Bureaucratic corruption, it takes place whenever there is transaction between the sphere and non-state act or of public administration in which public authority is illegally oriented private [Heidenheimer *et al.* (1993:6)]. However it is obvious that this definition does not fully distinguish the two types of corruption. It does not specify anywhere the real state level involved in corruption. However in the classical theory, political corruption involves only the elected policy makers. In contrast to recent work including research reports conducted by organizations like Transparency International, corruption equates senior government officials (ministers, chief of staff and other state officials) appointed to political corruption. Thus, according to Mery [Sardan (1999: 49)], political corruption is a kind of secret social exchange by which those in power (political or administrative) receive personal benefits of various kinds because of their influence or mandate due to their function. Undoubtedly, it achieves a certain ambiguity in the definition of political corruption. But this confusion lies in the fact that only certain jobs register corruption of senior administration officials as a major public corruption. However, jobs are all unanimous on the fact that political corruption has a large scale. Its consequences are very dramatic because they negatively affect both the sharing of national wealth but also affect the decision making process [Amundsen (1999)].

Moreover, many empirical studies also try to analyze the issue of political corruption. Thus, according to Ackerman (2002), corruption at the top of the state causes economic inefficiency and mostly affects foreign investment decisions and their nature in a country. The latter may be motivated by the fact that investors find the environment of their future investments, very little comfort. Investment security is often described as one of the determinants of the level of investment. This analysis is verified in the empirical work of Tanzi and Davoodi (1997). They found that countries with a relatively high proportion of large corruption recorded very low levels of FDI (Foreign Direct Investment), but in contrast to a share of public investment in Gross Domestic Product (GDP) and very important low quality of infrastructure [Kenny (2009)]. Political corruption favors big government projects *"white elephant"* that actually have very little impact on economic development [Faruqee and Husain (1994, p. 6)]. Intuitively one can imagine at this level that these costly public investments planned by these decision makers form their sources of personal enrichment and also help to conceal their

wrong doing. According to Ackerman (2002), the opportunistic policy maker always chooses the project that maximizes his profit. Since it has good information about the characteristics of the project (including costs) and economic (including inflation), because of his status, so the value he assigns to the project is still higher than its actual value. The goal is to secure his pension, but also to maximize it. But it establishes contracts with firms to implement projects so that it provides enough benefits to them. Then both parties will divide the winnings. The choice of the firm for the project may also depend on good personal relations between leaders and decision-makers of the firm [Kikeri and Nellis (1989)]. However, Ackerman (2002) shows that such collusion affects the business climate because it creates uncertainty for firms. First, they may well suspect that the regime is unstable since headed the corrupted politicians. Then they could imagine their contracts challenged with a new regime more concerned with the collective interest. In the end, having paid bribes to the policy makers, these firms can also imagine that they extort them permanently. Indeed, according to numerous studies, privatization can be a sure way to limit opportunistic behavior of policy makers because it allows the passage of a discretionary system to a system that is subject to market [Manzetti and Blake (1996); Manzetti (1997, 1999)]. Again many studies show that the procedures for privatization are probably more likely to know the bribes and lobbying. In this context, corruption scandals revealed, helped to discredit many politicians in both developing and rich countries.

2.2. Bureaucratic Corruption and *"Petty Corruption"*

Bureaucracy refers to the vast and complex administrative organization, with its hierarchical formal procedures. The *"bureaucracy"* term was introduced by the French philosopher Jean Claude Marie Vincent de Gournay (1712-1759). The word is of French origin, "bureau" means desk, table and the Greek suffix *"kratia"* means power, force, and principle. The word bureaucracy began to be used in France, shortly before the Revolution of 1789, and then it spread to the rest of the world. In the literature of sociology or political science, there are generally two different meanings of the word bureaucracy. According to the Weberian concept, the bureaucrat is a highly qualified person, who puts all his know-how at the service of his superior [Max Weber (1922)]. The managerial concept for bureaucrats defines them as state officials who make decisions taking into account their own preferences [Buchanan *et al.* (1980), Krueger (1974)]. Indeed, economists are more interested in the second view of the bureaucrat. In the economic literature, the bureaucrats have the same behavior as the

maximization of private agents. If a priori, they are intended to make policy in the collective interest, they may also be tempted to maximize their salaries, perquisites, to have more power, honor, facilities etc. Generally there are two types of bureaucratic models in the literature. The first type has an impact on the size of public sector, while the second generates an *X-inefficiency*. Though the goals of the bureaucrat can sometimes seem ambiguous, many authors, however, show that there is a positive correlation between certain variables that concerned the bureaucrat and the size of government to which he belongs. The famous model of budget maximization [Niskanen (1971)] and the Leviathan model [Brennan and Buchanan (1977)] can clearly define this framework. The Niskanen model hypothesized that the office tends to maximize the budget received from the higher court or authority. The relationship between the two levels is similar to a kind of bilateral monopoly where the government buys a service provided solely by the office at a given cost. In return, he receives a government budget depending on this service. However, if the bureaucrat is benevolent, as according to the Weberian conception, he will maximize the difference between the budget received and the production cost of service, and then donate the difference to the government. Thus at equilibrium, the marginal budget equals the marginal cost of production. But according to the model of Niskanen (1971), there is asymmetric information concerning the function of production costs of the service. The government has no information about service costs. However the bureaucrat knows perfectly his own costs and he is supposed to maximize the difference between the budget received and his costs under the constraint that those costs are not greater than the budget. An important implication of the model of Niskanen (1971) is that the bureaucrat's objective is not to remove any discretionary pension. Rather, it seeks to maximize the size of his administration to have benefits in terms of wages, indirect benefits, honor etc. Migué and Belanger (1974) as well as Breton and Wintrobe (1975) have criticized the approach of Niskanen (1971). For Migué and Belanger (1974), the bureaucrat maximizes the difference between the budget received and the cost of production. This, then, frees an annuity often called residue tax (fiscal residuum or Organizational slack) that appears in the form of unnecessary travel expenses, staff expenses, salary increases, perquisites, short over time, expense accounts etc. [Wyckoff (1988b)]. According to Wyckoff (1990a), these behaviors are *X-inefficient*. Other alternative models on the bureaucracy have also been developed and involve many questions about both political science and economics. Miller and Moe (1983) develop a model where the government has the ability to conceal his request, thus pushing bureaucrat to reveal its true costs. Benson and Mitchell (1988) opt for the abolition of

the monopoly in initiating a model where the private sector produces the same service as the office. The purpose of this competition is to push for lower prices.

3. Theories of Corruption

Theories of corruption are based on the analysis of relations between state and society. This observation reveals that in many countries in some cases, this relationship benefits one group.

3.1. Theory of Distributive Corruption

The theory of distributive corruption highlights the weakness of the state in its relationship with the society. This theory is based on empirical evidence in some countries like Russia or Bangladesh where state failure has gradually been caused by the power of patronage networks. This theory is characterized by the dominance of one social group (ethnic or regional) or economically powerful enough to challenge the state in all its authority. Through bribery, this class derives enormous benefits of their activities for example requiring officials to work towards their favor. Thus these groups may receive particular policy makers, public goods and services; advantages in terms of regulation. In return, the policymaker is guaranteed the political support of these powerful lobbies. At this level the main beneficiaries of public resources are not diverted politicians or bureaucrats, but these resources are distributed to the powerful clans social or economic (hence the term distributive corruption) in the form of tax exemptions, grants, leases, pensions, health coverage and housing etc. However, these groups earn more than they bring in terms of investment or public projects, aid for internal development. Moreover, the loser is undoubtedly the state and its regulatory power. All its capacity to mobilize revenue, to implement consistent policies and priorities becomes eroded [Amundsen (1997)]. Indeed, distributive corruption affects the poor, because the basic public services including education, health, social security... are allocated based on the ability of individuals to influence policy and to pay bribes. In the literature, the *"feudalization"* term is used to describe this state of powerlessness. This refers to the feudal system that was characterized by exploitation and manipulation of a majority by a minority group. If short term, those in power may benefit from political support of the clans in terms of loyalty; in the long run, the unity of the state is jeopardized.

3.2. Theory of Extractive Corruption

Unlike the previous case, this theory postulates that the state is the strongest in its relationship with society. It is even considered too strong. This theory is based on the authoritarianism of the ruling class in some countries. At this level, the ruling elite use the state apparatus as a tool for extracting the wealth from society. This analysis refers to the famous quote that supports that *all power tends to corrupt but absolute power corrupts absolutely*. This is particularly the case in many African countries. Indeed, the powers that are trying to develop arrangements and sophisticated modifications to the image of the party system, the appointment of rivals to reduce the power-sharing. The lawlessness, violation of human rights and electoral fraud also become instruments on which dictatorship. Thus violence is taking over the charisma and persuasion. Political corruption is also becoming the preferred instrument of private appropriation of collective resources. Corruption in mining, the state is inefficient and resources are not distributed according to needs. Investments are not made in productive areas. Appointments and promotions in the public sector are not based on merit, but they depend on political and economic interests.

Corruption stems from the extractive neo-patrimonial system present in many African countries, Latin America and Asia. This concept is widely used in political science to describe undemocratic regimes characterized by assimilation of public ownership to private ownership, as well as a strong presence of the patron-client relation. In neo-patrimonial system, public resources are distributed in the form of employment, contracts, grants and other public resources to allies and friends. In some countries in sub-Saharan Africa, the neo-patrimonial and clienteles' practices are the foundation of the hegemony of the ruling class. Amundsen's survey (1997) shows that countries like Côte d'Ivoire and Cameroon, are led by a group of about 50 families who have control over public resources of the state. Many civil wars in Sierra Leone in particular, Liberia and Congo/Brazzaville originate from the grip of the ruling class on the collective resources.

4. Causes of Corruption

In the economic literature, the authors found many explanations to the phenomenon of corruption. Theories generally point their finger at economic, political, institutional and even cultural. These factors contribute to corruption in different degrees in different countries and

regions. However, it seems important to understand the phenomenon in all its generality in order to address them effectively.

In theories of development, corruption is perceived as a socio-political consequence of the exploitation faced by underdeveloped countries. Under this prism, the phenomenon of corruption is seen as caused by the developed countries. Moreover, most empirical studies are unanimous that the level of corruption varies negatively with economic growth [Mauro (1995, 1997)]. This analysis helps to raise for instance the direction of causality between income and corruption. While some studies show that corruption hinders economic growth, thus implicitly income growth [Mauro (1995, 1997), Pellegrini *et al.* (2004)], and many others argue the opposite. For them, people are tempted by bribes, kickbacks because they have low incomes [Klitgaard (1998)]. Both approaches seem intuitively logical. Klitgaard (1998) meanwhile, formalized corruption in a simple mathematical equation ($C = R + D - A$). He stated that the determinants of corruption (C) are summarized by the opportunities of economic rent (R) in a country, the wide discretion of officials and politicians (D), as well as by the fact that they are held accountable for their actions (A). Mathematically this equation means that the level of corruption varies positively with the opportunities for rent-seeking and the discretionary power of bureaucrats. The principles and opaque regulations are the administrative procedures that characteristically tend to dampen business and economic activities [Klitgaard (1998)]. This indirectly encourages corruption because officials prefer to simply work around and the transaction costs become very high [Kaufmann (1998)]. Moreover, Klitgaard (1998) argues that the wide discretionary power given to officials to decide on laws and principles to be applied, to ensure their strict enforcement, may also be a source of corruption. Indeed, the bureaucrat may well abuse their power and exploit for personal purposes.

In particular, one can imagine for example that he decided to make administrative procedures more stringent and opaque in order to maximize bribes. Klitgaard (1998) concluded, however, decrease corruption when these bureaucrats are held accountable for their actions. In other words, it is important that officials are accountable for their acts before national institutions.

Moreover, in the economic literature, some authors discuss the causes of corruption according to whether the phenomenon is of political nature (large corruption) or bureaucratic (petty corruption). In the context of political corruption, corruption of politicians is not motivated by greed or a need for improved standards of living. At first glance, these politicians are wealthy

and therefore largely immune to these needs. Many other factors can explain these behaviors, including willingness to remain in power, to enjoy privileges such as honor, glory. Many studies also show that the issue of financing electoral campaign and corruption is a very important political sciences' issue. The politician is obliged to meet expenditure within his party coalition, for its employees to be reassured of their support and loyalty. In some countries, especially in Africa because of tradition, the leaders have a moral obligation to bear the expenses of the community (tribe, club, association, etc.). Johnston (1983) shows in his study that the tradition has a positive effect on the degree of corruption.

However, with bureaucratic corruption, the main motivation of bureaucrat is to improve his lifestyle and that of his family, by enhancing their salary. This major objective leads to behave opportunistically. However, no study demonstrates that bureaucrats are less greedy than politicians [Klitgaard (1998)]. Studies show nonetheless a mere increase in salary is not sufficient to reduce significantly the level of corruption. Often this policy tends to backfire if specific measures are not taken to this effect. This is precisely the case when wage increases, then traders decide in turn to increase prices. So, it follows inflationary pressures to the detrimental of all.

Based on Kaufmann and Gray's (1998) surveys, to detect the causes of corruption, we should consider what is likely to bind the bureaucrats and politicians in particular. This applies among other procurement, the benefits granted by the state government revenue, saving time and circumventing regulations and the deterioration of the legal process. According to Kaufmann *et al.* (1998), bribes may significantly influence the awarding of public contracts, the monetary benefits that the state grants (including grants, tax exemptions, pensions, etc.) as well as benefits in kind of housing, medical care, interest in companies being privatized. They can also deteriorate gradually and regulations to encourage illegal activities like drug trafficking, pollution.

Amundsen's (1997) theoretical studies conclude that liberalism and decentralization are, to a large extent, contributing factors to the expansion of the phenomenon of corruption. They argue that these factors can multiply the decision-making bodies that are likely to foster corruption. According to Amundsen (1997), extreme levels of corruption are found in countries that once belonged to the Soviet bloc. For him, the bribery would be due to the fact

that these countries still have weak institutions for their having lived a double political and economic process (communism and liberalism).

5. Consequences of Corruption

The damage caused by corruption can be enormous. They vary depending on the degree of corruption in society. When corruption is rare in a society, it becomes relatively easier to detect and fight before it spread. Indeed when it is widespread, it becomes much more difficult to control. But the worst scenario is when corruption becomes systemic. In the latter case, the institutions, laws, behavior of individuals and disrupt converge corruption. In other words, corruption is becoming the lifestyle of society. Systemic corruption is more difficult to control, and its effects on the economy can be pernicious. Some economists argue that corruption may have virtues. This is particularly when it can boost economic activities and the business environment by streamlining bureaucratic procedures deemed rigid and complex. Although many theoretical and empirical studies show that corruption undermines economic growth and development [(Amundsen (1997), Mauro (1995, 1997), Kaufmann *et al.* (1998)], some Asian South-east countries have had a strong economic growth despite systemic corruption [Amundsen (1997)]. Contrary to that in many African countries, corruption has particularly affected the economic growth because it resulted in a significant decrease in the volume of Foreign Direct Investment (FDI) and foreign aid.

However, in general, the theory is supported by most empirical work that argued there is a negative relationship between the level of corruption and development because it undermines investment, foreign aid, taxation, entrepreneurship and economic planning. The economic costs associated with the phenomenon of rent-seeking are enormous.

5.1. Growth of Shadow Economy

Corruption fosters the emergence of underground economy (shadow economy) where legal and illegal economic activities are beyond the control of the state. When most of the economy is reflected in the informal sector, macroeconomic data become unreliable because they reflect only the characteristics of the real economy. Thus, it becomes difficult to assess the economic performance and to make forecasts [Myint (2000)]. For instance, inflation control becomes almost impossible. The reason is because the Consumer Price Index (CPI) which is based on economic calculations and predictions is biased, all things being equal. However, in

the consumer basket, there are many goods and services from the informal sector [Dreher and Schneider (2010)]. This is particularly true of many poor countries. Moreover, on the capital market, a significant volume of informal financial transactions takes place. Thus, the benchmark official interest rate does not reflect the real cost of capital.

5.2. Investment

Undoubtedly, investment remains the economic variable most directly affected by corruption. This relationship is evidenced in many empirical studies [Mauro (1995), Lambsdorff (2003), Pellegrini *et al.* (2004), Khamfula (2007), Swaleheen *et al.* (2007), Aidt (2009)]. Foreign Direct Investment (FDI) is crucial for the economy. They help to modernize the economy by bringing technology and know-how to make the economy competitive. They promote the improvement of living standards through multiple jobs. But it is obvious that all these beneficial effects do not benefit a country if certain conditions are met. These are for example the economic climate, political stability, the functioning of institutions and so on. These conditions depend on the investment decision. But when the economic environment is strongly influenced by corruption, all things being equal, this has a negative impact on both quality and volume of FDI [Mauro (1995, 1996), Amundsen (1997), Kaufmann *et al.* (1998), Myint (2000)]. According to the work of Myint (2000), when corruption is systemic, FDI is generally oriented towards country's natural resources exploitation, with little beneficial impact for the national economy.

5.3. Government Expenditures

Economically, the state budget is an expression of social and economic policy desired by the government. This budget is decided and implemented by politicians on behalf of the collective interest. But by analyzing the issue with a little hindsight, we might ask whether the composition of the government budget is not dictated by the behavior of partisan politician. To this question, studies reported in the literature lead to very different conclusions. The empirical survey developed by Mauro (1998) is probably the most popular. It shows that corruption has a significant impact on the composition of government expenditures. Mauro (1998) argues that some budget expenditures (including education) are less likely to foster corruption than others, probably because of their low intensity in high technology. Thus it cannot be any provision in this oligopolistic industry. In contrast, military spending has more chance to retain corruption [Mauro (1998), Myint (2000)]. Government's budget is often

structured to facilitate the rent-seeking [Mauro (1998)]. Thus we can conclude that corruption does not favor sectors such as education, yet a key development. In many countries, even developed, military field is a sector that enjoys a significant share of the budget on behalf of reform, defense programs etc.

6. Measures against Corruption

While corruption is clearly world evidence, it is more problematic in countries with low income. This hardly means that public servants or politicians in these countries are more corrupt than their counterparts in rich countries, but simply because poverty is a condition that favors the spread of corruption. To end it, it will address issues that are the cause and reverse it. However, when corruption enters the customs, a simple change of policy cannot alone be the remedy; the whole society needs to undergo a "major shock" to leave this stable equilibrium. Corruption must be fought because it is inherently bad, but because it is detrimental to economic growth. Economists generally argue that to limit behavior, it is essential to address the incentives for such behavior. In the specific case of corruption, this requires a coordinated global action, both internally and externally, as isolated measures are generally still dominated by the incentives for corruption.

According to Amundsen (1997), the control of corruption can be made using several channels. External control or international corruption is conducted by international financial institutions. The third world countries and must fulfill certain political conditions necessary for any financial assistance to development. One component of this conditionality is indeed "good governance". This technical term means a large extent: control of corruption, government effectiveness, regulatory quality, political stability, rule of law, and freedom of expression. Internal control (or institutional control) is probably more relevant because it determines the willingness of leaders to combat the phenomenon. At this level, the company must undergo a big push. This is possible only when there is a broad agenda covering all areas and also accepted by all. Although recall the fatalistic lack of success of the struggle against corruption, we must recognize that many countries have seen progress in this area. In such a short time, countries like Hong Kong or Singapore are passed from one stage of systemic corruption to an appreciable level significantly [Kaufmann (1997)]. Countries like Botswana, Chile, Portugal, Bolivia or Uganda have also been successful in their fight against corruption. These successes are due to extensive administrative reforms made by these countries.

According to Kaufmann (1997), the successes of Uganda in the fight against corruption are due in particular to the establishment of anticorruption bodies to reform its public administration, more checks and audits within state, granting wider powers to the inspectors of administrative services, as well as extensive public awareness campaigns of the entire society. Empirical studies show that the level of corruption tends to decline with the strengthening of democratic institutions [Amundsen (1997)]. It is therefore important to establish efficient mechanisms of control, detection and punishment of corruption. Some institutions like The World Bank or the IMF suggest radically countries plagued by corruption thrust to significantly reduce the number of public and instead encourage the privatization, which in turn, is subject to the market mechanism [Amundsen (1997)]. Uphold the ethics and professionalism within the administration and the separation of powers may be different ways to focus on preventing corruption.

Part II

The Empirical Evidence of Theories

Part II

The Empirical Evidence of Theories

Constant experience shows us that every man invested with power is apt to abuse it, and to carry his authority as far as it will go.

Charles-Louis de Secondat Montesquieu, (1748)

As announced in general introduction, the second part of this Master's Thesis will be devoted to the empirical description of the theoretical literature. Indeed, the theoretical literature is as vast as the empirical work implemented. The latter try to test multiple and varied assumptions; such as:

How corruption affects the productivity [Lambsdorff (2003)]? According to the author, if it is obvious that corruption affects the investments, the studies tending to highlight its effect on the productivity are far from numerous. In general in these studies, the productivity is measured by a perpetual inventory of the GDP compared to the stock of capital. Lambsdorff (2003) watch in its study that by reducing the level of corruption of Tanzania to that of the United Kingdom, the Tanzanian productivity would increase by 10 %. This would increase the GDP of 20 %.

What is the contribution of corruption in the institutions failure and bad governance [Aidt (2009), Everhart et al. (2009), de la Croix et al. (2009)]? The recent works of de la Croix *et al.* show for example that the effect of corruption on the public investments is not always the same one. More precisely, it depends on the way in which the capacity is concentrated in the hands of the opportunist politicians. They find for this purpose when this concentration of the capacity is very strong, potential corruption increases and increases in its turn the current level

of corruption. Then, it appears an obvious ousting of the investment in human capital in favour of the investment in physical capital. On the other hand, with the more democratic modes, certainly potential corruption increases, but that does not have any effect on the current level of corruption. That led to an increase in the human capital expenditure compared to the capital expenditure physical.

How corruption acts in a drastic way on foreign direct investments (FDI) [Khamfula (2007)]? This level, the author shows that when the degree of corruption grows, that is reflected on the FDI flow which decreases at the same time in the countries whose industrial strategy supports the promotion of exports (export promotion-EP) and which those supporting the imports (importation substitution-IS)[1].

Does corruption worsen income inequalities [Gyimah-Brempong et al. (2006)]? By using data of panel and estimators dynamic, this work concludes that corruption has a negative impact on the income growth rate, more considerable in Africa. Whereas a broader negative impact on the distribution of income is observed in the countries of Latin America. More precisely, they find that an increase of 10 % of the level of corruption, involves a fall of the growth rate of the income which would pass from 2.8 to 1.7 %. While one standard deviation increase in corruption is associated to an increase in income inequalities from 0.05 to 0.33 points.

Which are the effects of corruption on the growth and economic development [Mauro (1995), Aidt (2009)]? For example, Mauro uses data set consisting of subjective indices of bureaucratic honesty and efficiency to establish an empirical obviousness of the effects of corruption on economic growth [Mauro (1995)]. His famous survey concludes that corruption is negatively related to investment, as well as the economic growth. For example, he finds at that time that when Bangladesh improves its bureaucracy integrity and efficiency level until reaching that of Uruguay (corresponding for Bangladesh to one standard deviation increase in its bureaucracy efficiency index), its investment rate would rise by almost 5 percentage points; and the yearly GDP growth rate would rise by over half a percentage point.

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[1] According to Bhagwati (1978) in Khamfula (2007), export promoting is one of the trade strategies where the average export rate is equal to that of import. This strategy is also known as trade neutral. While in import substitution strategy the average import rate is greater than that of export. This strategy favours import activities.

Which are corruption's transmission channels and what is the contribution of each one of them to the increase in corruption [Pellegrini et al. (2004), Lambsdorff (2003)]? In their paper, Pellegrini *et al.* (2004) find that corruption's indirect transmission channels, in particular investment, trade policy, education and political stability, prove to be significant in the explanation of corruption effects on economic growth. In their estimates, jointly, these four variables explain 81 % of the effect of corruption on growth. From their simulations, one standard deviation increase in corruption perception index (CPI) is associated with a decrease in investment by 2.46 percentage points, which involves a fall of the economic growth of 0.34 percentage points per year. An increase in the same order in CPI reduces the index of opening by 0.19 percentage points, which reduces in its turn economic growth of 0.3 percentage points per year.

Does corruption influence the structure of government expenditures [Mauro (1998)]? The results provided by this article, made it possible to highlight the existence of a negative, significant and robust relation between corruption and the budgetary expenditure in the sector of education. In addition, the empirical studies show that the latter is an important determinant of economic growth. According to Mauro (1998), a plausible explanation of the correlation observed between the CPI and each component of the budgetary expenditure is that, corrupt governments find that it is relatively easier to extract bribes or to misappropriate funds with certain budgetary expenditures than others. For this purpose, education seems to be a nonprivileged target by corrupt politicians, probably because its supply does not require high technology; and it is not the fact of an oligopoly.

These assumptions are as important the ones as the others. This clearly shows all the range of the study on corruption. However, it still remains many interrogations not yet completely elucidated in this vast empirical literature. However, this Master's Thesis does not claim to approach the whole of the problems that corruption raises. He intends more to be based on the three last assumptions quoted in the preceding paragraph. Thus this second part of the document tries to test three assumptions. For that, it develops three econometric models of reference which will be successively the subject of tests and analyses in three different sections. The first section highlights the impact of corruption on the economic growth. At this level, this document bases on both models developed in Pellegrini *et al.* (2004) and Us Swaleheen *et al.* (2007). The second section will lean exclusively on the contribution of a certain variables to corruption. In the literature, these variables are known as corruption's

transmission channels. According to many studies, these variables are detached from the others, thanks to their very significant influence on corruption [Pellegrini *et al.* (2004)]. The last section tests the effect of corruption on the structure of the budget of the State. However she postulates the assumption according to which certain items of government budget are more likely to support corruption than others [Mauro (1998)]. Thus, the idea is that the opportunist politicians could indeed allocate more funds in the fields where corruption is easier to implement in order to extract rent as much as possible. Consequently, the budget structuring which represents basically the countries general economic policy could be handled well to meet a need not acknowledged.

1. Corruption and Economic Growth
   1.1. Theoretical Background

What is the nature of the correlation between the level of corruption and the economic growth? Here the main question which has continued to cause many debates for already several decades. Many researchers try to answer to this interrogation by observing for example the evolution of the real growth rate of the GDP per capita compared to corruption perception index (CPI) in several countries.

Certain studies conclude that corruption can have well a positive effect on economic growth [Braguinsky (1996), Kaufmann *et al.* (2000)]. This idea is based on "greasing wheels hypothesis". In others words, corruption allows to bypass bureaucratic procedures by facilitating economic activities. However, according to Mauro (1995), corruption would support the economic growth because it significantly makes it possible to reduce the times of treatment of files and to circumvent the bureaucratic procedures. According to Kaufmann *et al.* (1998), a study on the competitiveness carried out by World Economic Forum shows the entities with a high level of corruption correspond also those where the bureaucrats spend more time treating the administrative files relating to the negotiations of licences, permits, signatures and taxes. In addition corruption can support the performance of the market, because *"good firms"* have the possibility of avoiding bureaucratic heaviness and take part in the market [Lui (1985)]. Graziano (1980) and Huntington (2002) approach the impact of corruption on the growth under another viewpoint. According to them, *grand corruption* can indirectly allow to strengthen the links within the populations. Consequently those will tend more to be linked because they feel in the same camp: that of the victims. That led to its tower

to reduce the risk of conflict within the population. This stability influences the economic growth positively. In addition, it should be noted that *"greasing wheels hypothesis"* does not claim however that corruption is beneficial constantly and in any place. It becomes advantageous when certain aspects of governance are defective and/or the economic policy, inefficient [Aidt (2009)]. However it seems difficult to make so that corruption generates only its positive effects which are only the economically desirable ones [Rose-Ackerman (1978)].

On the other hand, other relatively robust studies conclude that corruption has a negative impact on economic growth [Shleifer *et al.* (1993), Mauro (1995), Mo (2001), Aidt (2009)]. According to Shleifer *et al.* (1991), countries in which qualified and talented individuals devote themselves to opportunist behaviors or bribing, have a relatively slower growth. In addition, a sure means through which corruption can act on the economic growth remains obviously the taxes. Corruption supports tax evasions enormously; which in their turn negatively influence the allocation of public goods and services and economic growth [Loayza (1996), Johnson *et al.* (1997, 1998)]. At the same time as it, the underground economy (shadow economy) tends to take a significant proportion as the level of corruption increases and that the bureaucracy becomes increasingly inefficient. This idea is amply highlighted in the empirical survey completed by Frye and Zhuravskaya (2000); Johson *et al.* (2000); Schneider (2000); Alexeev and Pyle (2003); Hellman *et al.* (2003). In addition, other factors are singled out like significantly influencing corruption. In the economic literature, they are called corruption's transmission channels. These are for instance investment, education, openness, and political instability variables. These various factors are constantly quoted by empirical work as variables which could allow to reduce or to worsen corruption [Pellegrini *et al.* (2004)]. Moreover the second section of this empirical work will try to examine these factors.

In this section, it will be exclusively question of testing the impact of corruption about the economic growth. The study relates to twenty-three (23) OECD countries and the database used extends from 1995 to 2009. The list of these countries is in appendix.

1.2. Data

In this section, one considers a classical growth model in order to measure the effect of corruption on the economic growth. However, the document takes as a starting point a model

of economic growth developed by Romer (1986), Mankiw *et al.* (1992) by considering a function of production whose structural form is the following one:

$$\Delta \ln(G^i) = \alpha_0 + \alpha_1 \ln(Y_0^i) + \alpha_2 C^i + \alpha_3 \Omega^i + \varepsilon^i \qquad (1),$$

where *i* represents each country in the database. The denoted dependent variable G^i symbolizes the annual real GDP per capita from the period $t_0 = 1995$ to $t_T = 2009$. The data concerning this variable are in logarithm. The Boxcox transformation indicates that $\lambda = 0$ belongs to the confidence interval (see graph 2). That means that the logarithmic curve estimate of the endogenous variable gives results much more relevant. The $\ln(Y_0^i)$ variable represents the initial income. According to the conditional convergence hypothesis, this one should have a negative coefficient ($\alpha_1 < 0$). The growth rate of the income is inversely related to the income on the initial period [Mankiw *et al.* (1992), Islam (1995; 2003)]. The second independent variable is corruption, denoted C^i. The expected sign of its coefficient is prone to much discussion as previously evoked. Ω^i and α_3 are respectively the vectors of the classical growth variables and the parameters to be tested. In this model (1), one regards as components of the Ω^i vector, the following variables: physical and human capital; political stability; openness; and unemployment. In end, α_0 and ε^i are respectively the model fixed effect and error term.

The choice of the various variables as well as their expected effects on dependent variable corroborate with growth literature logic. However, it is possible that it occurs divergence between expected effects and the really observed ones.

In model (1), the physical capital is taken into account by *Investment* variable. It represents the share of investment (both private and public investment) in real GDP per capita. According to the economic literature, this variable should have a positive impact on economic growth. The famous Solow growth model shows how the increase in the stock of capital or/and labour, as well as increase in the level of technology influence production. The human capital its turn is taken into account by *Schooling* variable. This one represents the enrollment rate in tertiary education. The values are calculated by dividing the number of students in tertiary and the total population of the age group in age to make these studies. *Schooling* variable is expressed in percentage of logarithm. It has been noticed that with an estimate with

logarithmic data, the model performs better. Moreover, it appears reasonable to take into account the lag students training moment (t) and the moment when the latter become actually productive $(t+1)$. It is not easily conceivable that the acquisition of competences or even the efforts of innovation bears their fruits in an instantaneous way. To take into account this logic, one regards as human capital stock of a given year, that corresponding to the previous period. In this study, we suppose three (3) years of interval. The human capital is regarded in growth literature huge factor, translating the individuals' degree of competence and know-how. Intuitively, one can imagine that the more this rate of schooling is raised, the more there is potentially labour qualified and ready to take part in production. The quality of labour is a parameter which can positively influence the productivity of production factors; and further the economic growth. However, according to the empirical studies carried out, the contribution of the human factor would be also significant but not as that of physical capital factor. The relative data with the human capital come from The World Bank database.

Several indicators make it possible to measure the level of corruption of a country: in particular Bribe Payers Index (BPI), Global Corruption Barometer (GCB)[2] or Corruption Perception Index (CPI). However, to symbolize corruption variable (C^i), the study based on CPI which is undoubtedly the most reliable and the most frequently used in empirical work. It is provided annually by Transparency International (TI) since 1995 and its value varies from 0 to 10. This index indicates the degree of transparency and corruption both in countries local and central level. The more a country's CPI is close to 0, the more the level of corruption in this country. On the other hand the least corrupted countries see their CPI relatively close to 10. The issue of the effect of this variable on economic growth will be the main topic of debate of this section. Once again, the ideas are shared on this issue, though a number relatively higher of empirical studies concluded for a negative correlation between corruption and economic growth [Mauro (1995), Mo (2001), Aidt (2009)].

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[2]BPI measures the likelihood for firms of the 22 largest exporting countries of the world to pay bribes abroad. These countries account for nearly 75 % of global FDI flows and world export.

GCB assesses general attitudes of the public and is based on the experience of corruption in douzen countries around the world.

The list of countries as well as data on these indices is available through Transparency International (TI).

Some other factors can also indirectly influence the economic growth thanks to their impact on the productivity of capital and/or labour factors. Political stability is in particular a variable which takes into account this dimension. In the economic literature, it is indicated like positively correlated with investment. This assumption seems perfectly logical because political stability is one of the criteria which determine the investment decision. Recent work of Haksoon (2010) concludes that the countries having a relatively high level of political stability are also those which record enormous Foreign Direct Investment (FDI) flows. Thus, the more a country is politically stable, the more the investors are willing to invest there. In this study, this logic is captured by the *Pstability* variable which represents the index of political stability and absence of violence. Its value varies between -2.5 and +2.5. This indicator measures the likelihood that a government will be destabilized or overthrown by possibly unconstitutional and/or violent means, including domestic violence and terrorism. Low scores in this variable indicate that citizens cannot count upon continuity of government policy or the ability to peacefully select and replace those in power. On the other hand, high scores in the index mean a higher probability that these conditions are not met. Data relative to this variable are obtained via *World Resources Institute (Earth Trends/Environmental Information)* and they are available for years 1996; 1998; 2000; and from 2002 to 2008.

In addition, the present study takes into account the opening of the economy. This aspect relates in particular to the country openness to international exchanges. In the economic literature, the opening of the economy to the rest of the world is regarded as a factor which significantly influences growth. That is clearly highlighted by many theoretical and empirical surveys [Rao and Singh (2010)]. The recent paper completed by Madsen (2009) concludes that if the economic growth is independent to economy openness; on the other hand the latter is strongly correlated with the transfers of foreign know-how which in its turn increases productivity. In this model, countries openness for a given year is calculated by making the sum of that year total import and export and by dividing it by the real GDP of the same year. This ratio is expressed in percentage of GDP. However, the relative data with this variable, as well as those of real GDP per capita and investment are provided by Alan Heston, Robert Summers and Bettina Aten, *Penn World Table Version 6.3,Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, August 2009.*

Economic growth and unemployment remain major goals of economic policy. However, the nature of the correlation between these two variables is the subject of many studies. This one seems clearer in short run analysis framework because it has been fully carried out by the majority survey that unemployment has obviously a negative effect on growth. These ideas are consolidated by the famous Okun rule which supports that the fall of unemployment rate goes hand in hand with the rise of production. On the other hand the long run analysis causes few divergences. However, though that can seem against-intuitive, it is possible that unemployment and growth can cohabit simultaneously. One can imagine this scenario type when the productivity grows independently of the labour factor. Thus the companies can have to lay off part of their staff because the level of production wished can be largely assured by a weaker labour. Further this strong productivity can be an economic growth factor. In model (1) estimate, this intuition is captured by the *Unemployment* variable which represents annual unemployment rate. Table 4 presents the descriptive statistics for all the variables in model (1). Graph 1 shows the effect of each independent variable on the GDP per capita growth rate [$\Delta \ln(G^i)$].

Considering the study relates to dynamic data; and for reason of reliability, the database was divided into various periods: 1997; 2000; 2003; 2006; 2009. Each period thus includes three (3) years and the data corresponding to each period are obtained by calculating the average of the data corresponding to the two previous years plus those of the year corresponding to the aforementioned period. For example, the data of period 1997 are the average of those of the years 1995; 1996 and 1997. It is the same for the following periods. The following sub-section presents model (1) estimate results.

1.3. Model Specifications and Empirical Results

The idea to implement a cross-country regression or rather to choose a panel data structure, means that one puts forth a priori certain assumptions. In the precise case of the model (1) of this paper, choosing a cross-country regression instead of panel one means that one supposes an identical production function for all the countries concerned by the study. More particularly, elasticities of production factors are supposed to be similar for all the countries. Indeed, this assumption is aberrant because generally with the incorporated data, it is not very probable that is checked because there is strong chance that structural or temporal geographic factors (countries' position compared to the markets, climate…) can bring differences

between countries in their production; and further in their growth. On the other hand, the option of panel model admits there is a possible existence of specificities specific to the countries. This alternative is most likely though it has also limits. The homogeneity test however makes it possible to lead to the choice of the type of model more adapted. In the first step, a Fisher test is implemented. In null hypothesis on assumes a homogeneous panel model *(pooled)* against a fixed effects one *(within)* in alternative hypothesis. The synthesis of this test is noted below:

```
F test for individual effects
F = 4.0175, df1 = 22, df2 = 62, p-value = 8.236e-06
alternative hypothesis: significant effects
```

The P-value is below the critical threshold standard of 5%. This result allows rejecting the null hypothesis and accepts the idea that one is dealing with a fixed effects model. The second stage of homogeneity test is implemented with Hausman test. The latter tries to check whether the fixed effects revealed by the Fisher test are random. However, in null hypothesis one assumes a model with random fixed effects. On the other hand, as alternative hypothesis, one considers a *within* model. The results of Hausman test are noted below:

```
Hausman Test
chisq = 21.7529, df = 7, p-value = 0.002802
alternative hypothesis: one model is inconsistent
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Due to a P-value (0.002802) less than the critical threshold $\alpha = 5$ %, the test concluded with the predominance of the random fixed effects *(random model)*. Finally, the Breusch-Pagan test will make it possible to choose the suitable model because the structure of panel is not completely rejected. In practice, it is a question of checking whether the constant of the model has an individual dimension. In other words, one has to check whether the multifactor productivity[3] is specific to each country. The statistics of Breusch-Pagan calculated below confirm the conclusion of the Fisher test that there are fixed effects.

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[3] The multifactor productivity corresponds to the variable A of the Coob-Douglas famous equation [$Y = A.K^{\alpha}.L^{(\alpha-1)}$]. Y represents the global production (GDP). K and L variables are respectively investment

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Lagrange Multiplier Test - (Breusch-Pagan)
 chisq = 4.5137, df = 1, p-value = 0.03362
alternative hypothesis: significant effects
```

Now, it arises from homogeneity test, the existence of random fixed effects. In other words, there exist economic specificities particular to each country. Besides, these characteristics are a nature random. Usually for this kind of model estimate, the Generalized Least Squares (GLS), Generalized Method of Moment (GMM) or Hausman-Taylor (HT) estimators are used. They are considered to provide relatively reliable results for this purpose. However this study will be limited only to GLS estimator whose results will be confronted with those provided by the basic random method estimator. Tables 1 and 2 present the results of model (1) estimates with the *random* and GLS estimators, respectively. Each one of these tables presents four regressions having the same dependent variable which is the annual GDP per capita growth rate [$\Delta \ln(G^i)$].

Regressions (1) and (5) of tables 1 and 2, respectively estimate $\Delta \ln(G^i)$ only according to the initial income [$\ln(Y^i_{1995})$]. The coefficient of correlation between these two variables equals -0.38; what translates an inverse relationship between them. That corroborates perfectly the conditional convergence hypothesis. The latter also supports an opposite relation between GDP per capita growth rate among a given year and the individual's income level in the previous year [Islam (2003)]. This result is also confirmed by regressions (1) and (5); and the estimated coefficient (α_1) of the independent variable is of -0.034 for *random* estimator and -0.038 for the GLS one. In all the two cases, the variable is significant. Respectively, regressions (2) and (6) estimates the dependent variable [$\Delta \ln(G^i)$] against only *Corruption*. The graph 3 shows the cloud of points and the tendency of the regression curve. The coefficient of correlation between the two variables (-0.37) translated a priori an indirect relation. In other words, corruption has a negative impact on growth. However the two estimators predict the same estimated coefficient ($\alpha_2 = -0.003$) whose sign reflects the nature of the correlation. Any increase in the level of corruption of a unit, involves a decrease in GDP per capita of 0.003. More concretely, when CPI's mean value increases within these

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and labour factors. A variable captures the new technology, innovation ideas in Solow model. α and ($\alpha - 1$) are respectively capital and labour factors productivity.

OECD countries by 1 %, therefore from 6.63 to 6.676, the average GDP per capita growth rate decreases while passing from 1.025 to 1.022 %[4]. In addition, the explanatory power of the model (adjusted-R²) is of 10 and 12.7 % with the *random* and the GLS, respectively. That means for example with the GLS that corruption contributes to the dependent variable about almost 13 %. Regressions (3) and (7) of tables 1 and 2 respectively, show the $\Delta \ln(G^i)$ estimate with respect to the traditional growth variables excluding *Corruption*. With the *random* estimator all the variables are significant at least with the 5 % critical threshold except for *Pstability* which is not significant at all. On the other hand, with the GLS estimator, all the variables are significant at least to 5 % except for *Openness* which is significant only with 10 % of threshold. Broadly the results provided by the GLS estimator seem more relevant than those produced by the random. The explanatory power of regression (3) variables is 41 %, whereas the same variables explain the dependent variables about 44.1% in regression (7). Finally, in regressions (4) and (8) of tables 1 and 2 respectively, this document proposes to add to the exogenous variables of the regressions (3) and (7), *Corruption* in order to capture its contribution in the explanation of the endogenous variable. Initially, in the two regressions, the traditional variables almost preserved their degree of significativity and contribution to the explanation of the dependent variable. On the other hand, with *Corruption*, the *random* estimator indicates that its estimated coefficient is - 0.0022, but the variable is not significant. On the other hand, with GLS estimator *Corruption* is significant to 5 % and its coefficient $\alpha_2 = -0.0027$. Hence, a 1 % increase in the CPI's standard deviation increases by 1 % within these OECD countries (passing from 0.0174 to 0.0176), that leads to a decrease in their $\Delta \ln(G^i)$ which would pass on average from 0.025 to 0.022 %. One can, in addition, note a significant improvement of the R² which passes from 44.1 to 45.47 %. In this level also, GLS estimator is definitely more powerful than that of the *random*.

All in all, it arises from the test of the general assumption of this section that corruption reduces economic growth. This result joined the conclusions of many other theoretical and empirical studies implemented by researchers [Mauro (1995); Kaufmann *et al.* (1998); Amundsen (1999); Rose-Ackerman (2002); Lambsdorff (2003); Pellegrini *et al.* (2004); Khamfula (2007); Us Swaleheen *et al.* (2007); Aidt (2009)].

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[4] The average $\Delta \ln(G^i)$ passes from 0.025 to 0.022 %. However, by applying the exponential, the per capita GDP growth rate drops from 1.025 à 1.022 %.

2. Corruption and its Transmission Channels
   2.1. Theoretical Background

The empirical analyses carried out in previous section made it possible to conclude that corruption has a harmful effect on these OECD countries' growth. This section tries as for it to lean on how corruption acts on economic growth. On one hand, in economic growth literature, certain variables remain determining thanks to their great influence. The capital and labour factors are classically known within this analysis framework. Political stability as well as the degree of opening is also a major determinant. This theory is also proven by some empirical surveys. Obviously, it is by no means mentioned corruption in growth theory, as well as these variables. In addition, it is however possible that the degree of integrity of the bureaucracy influences these variables. For example, Mauro's survey [Mauro (1995)] shows an opposite relation between corruption and investments. Khamfula (2007) finds in its turn that the intensification of corruption gradually results in reducing FDI. Hakson (2010) finds empirically that political stability involves more FDI flows. Also it is highlighted by many researchers that the openness is a factor which significantly contributes to improve the economic growth [Rao and Singh (2010)]. Since there is such connection between corruption and these variables, one could imagine a certain number of intuitions. Initially, one can support that corruption reduces economic growth thanks to these variables which are used as instruments. Then imagining the scenario in opposite direction, one could as think as one of the means to reduce corruption impact on growth would also pass through the same variables. That is why in this second section; it comes to discuss about the correlation between corruption and these variables. Then, the paper will try to assess the marginal effect of corruption on each one of it. Thereafter, one can see how that is reflected on growth. This assumption is supported by the survey developed by Pellegrini *et al.* (2004).

The empirical test of this assumption is based on equation (2) whose structural form is the following one:

$$\Pi^i = \beta_0 + \beta_1.\ln(Y_0^i) + \beta_2.C^i + \mu^i \qquad (2),$$

where Π is the vector of corruption's transmission channels variables. The parameter i represents as in the previous section each country in the dataset. The vector of model (2) fixed

effects is symbolized by β_0, while β_1 and β_2 respectively are the vector of the initial income [$\ln(Y_0^i)$] and corruption (C^i) coefficients. The vector of residuals is in turn denoted by μ. The results of the estimates concerning model (2) are commented in the following sub-section.

2.2. Empirical Results

Tables 4 and 5 respectively summarize the estimate of the model (2) with *random* and GLS estimators. Broadly if the two estimators seem to provide quasi-similar results, one can however note that the GLS is slightly better that the random. The values between brackets represent the standard deviations whereas those in top indicate the estimated coefficients of the independent variables. Regressions (9) and (13) estimate the Investment variable with respect to initial income (Y_0^i) and corruption (C^i). With the two estimators, the estimated coefficient of *Corruption* remains no significant. It is of -0.35 and -0.3 respectively with the *random* and the GLS estimator. However while being based on the GLS, when corruption index increases on average about 1% in standard deviation, that results in a fall of the investments on average of 0.3 % per year. The average rate of investment thus passes from 29.27 to 28.97 %. That will have for effect to reduce in its turn the average GDP growth rate per capita which passes from 1.025 to 1.024 %. In addition, initial income in turn is significant only with the threshold of error of 10% with the *random* estimator. However the adjusted-R² seems very weak (4.5%). That is probably due to an endogeneity of independent variables. For example the variables *Corruption* and Y_{1995}^i seem strongly correlated (0.82). That could well affect the regression results. *Schooling* variable seems also negatively associated with *Corruption*. The relation between education and corruption is highlighted in the literature. According to the empirical studies carried out by Tanzi and Davoodi (1997), if on one hand corruption reduces the capacity of the government to increase its incomes; on the hand, it supports public investments in great projects of infrastructure. Thus, corruption reduces the availability of funds relatively having to be allocated in education. Mauro (1998) finds in his turn an opposite relation between the level of corruption and government expenditures in education. The estimated coefficient of *Schooling* is of - 0.516 in regression (14). That means that 1 % increase in corruption's standard deviation would cause to reduce the enrollment rate in tertiary education. This rate would pass thus on average in this OECD zone from 46.11 to 45.6 %. This is translated in its turn by a fall of the average GDP growth

rate per capita [$\Delta(G^i)$] which thus passes from 1.0253 to 1 %. Respectively, regressions (11) and (15) of tables 4 and 5 are contradicted on the relation between the level of corruption and the degree of opening. The *random* estimator concluded with a negative correlation with $\beta_2 = -7.17$. The latter seems indeed perfectly to corroborate with results found out by Pellegrini *et al.* (2004). Krueger's paper shows that import restrictions constitute potential sources of corruption [Krueger (1974)]. Southgate *et al.* (2000) also describe the relation between corruption and the allocation of trade licenses, import quotas and the implementation of other trade limitations. GLS estimator its turn indicates a positive relationship ($\beta_2 = 1.69$). Thus, 1% increase in CPI in this OECD zone involves more openness whose mean index level passes from 69.93 to 71.6 %. Hence, the annual GDP growth rate per capita passes from 1.0253 to 1.0256. Regressions (12) and (16) respectively estimate political stability against corruption with the *random* and GLS estimators. In both cases, the estimated coefficient of *Corruption* is positive and statistically significant (0.2). When corruption grows of 1 % on average in this OECD area, political stability and absence of violence index increases on average from 0.69 to 0.94. This improvement in political stability is translated in its turn by an annual increase in $\Delta(G^i)$ per capita about 0.24 %. However this positive correlation between corruption and political stability could seem a priori strange. Pellegrini *et al.* (2004) find as for them an opposite relation between corruption and a variable indicating political instability. However, according to Graziano (1980) and Huntington (2002), it is possible that corruption (*grand corruption*) and political stability cohabit.

In addition, it should be noted that the relations described between corruption's transmission channels and Corruption itself indicate only the nature of the correlations and not the direction of causality.

3. Corruption and the Composition of Government Expenditures
3.1. Theoretical Background

The first article to be itself interested on the relation between the corruption and the composition of the public expenditure remains incontestably that of Mauro (1998). This assumption, a priori simple, highlights two major implications. The first relates to the effects of government's expenditures, and more particularly their composition. On this question, economists' opinions diverge. Therefore certain empirical studies do not lead to nothing

conclusive [Levine *et al.* (1992), Devarajan (1996)], others find that the composition as well as the level of the level of budget can influence economic growth. In which case, it would be very important to limit corruption. The second implication of the idea of Mauro (1998) is that it makes it possible to measure the principal-agent problem. If this correlation between the composition of government's expenditures and corruption is weak, that means that the politicians (agent) are relatively just and honest with respect to the citizens (principal). The opposite relation would mean simply that citizens are dealing with opportunist politicians.

In a caricatured way, Mauro (1998) puts forward the idea that it is possible that corruption influences the structure of the expenditure envisaged in the budget. In theory, it is relatively easy to bribe in certain fields than of others. Thus, many studies conclude that public investments in general constitute a privileged field for rent-seeking activities [Faruqee and Husain (1994, p.6), Tanzi and Davoody (1997), Kenny (2009)]. On the other hand, Mauro (1998) in his empirical study finds that education field is less prone to corruption contrary to the army. It finds a negative relationship between corruption index of and public expenditures in education. For example, the opportunist politician can be inclined to structure the budget in order to support the fields in which corruption is relatively easier to implement. However, it remains still difficult to know why certain sectors support more corruption than others.

In this third section, this thesis will focus on testing the effects of the public expenditure on corruption. This study covers a total of thirty-five (35) countries whose list is in appendix.

3.2. Data

The data used for the empirical test of the main hypothesis of this section extend from 1990 to 2007 and relate to 35 countries with different realities. The structural form of the model is the following one:

$$C^i = \gamma_0 + \gamma_1.Z^i + \gamma_2.\Phi^i + \varepsilon^i \qquad (3),$$

where C indicates, as in the preceding cases, the CPI. It represents dependent variable of model (3). The parameter (i) symbolizes each individual (country) considered in the database. The model fixed effect is symbolized by γ_0 while ε indicates the errors. Z represents the vector of public expenditures. The latter includes: health expenditures (*Health*). This variable represents the share of government expenditures allocated to the health. It consists of

recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds. The coefficient of correlation between the index of corruption and the percentage of the health expenditure is of 0.74; that described a positive and strong relation. In other words, the more the health expenditures, the more the level of corruption. The second component of public expenditures is taken into account by *Secondary* variable. Public expenditure per student is the public current spending on education divided by the total number of students by level, as a percentage of GDP per capita. Public expenditure (current and capital) includes government spending on educational institutions (both public and private), education administration as well as subsidies for private entities (students/households and other private entities). According to work of Mauro (1998), there exists an opposite relation between this variable and corruption index. On the other hand in this study, the coefficient of correlation obtained between these two variables is certainly positive but very low (0.1). The third variable taken into account as public expenditure indicates the subsidies and other transfers carried out and envisaged in the government budget. Data concerning this variable, cover Subsidies, grants, and other social benefits include all unrequited, nonrepayable transfers on current account to private and public enterprises; grants to foreign governments, international organizations, and other government units; and social security, social assistance benefits, and employer social benefits in cash and in kind.. In this study, this variable is noted *Subtransfer* and is expressed in percentage of expense. The coefficient of correlation obtained between this variable and corruption is 0.7; a priori that described a positive and strong relationship. Another variable taken into account is the final consumer expenditure of the governments. It includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditure on national defense and security, but excludes government military expenditures that are part of government capital formation. This variable is denoted *Fconsump* and is expressed in percentage of GDP. The coefficient of correlation associated to this variable is 0.548. That means a priori that the level of corruption grows as government final consumption expenditures increase. In addition, this study also focuses on military expenditures as one of the components of public expenditures. This variable is expressed as percentage of central government expenditures. The data include all current and capital expenditures on the armed forces, including peacekeeping forces; defense ministries and other government agencies engaged in defense projects; paramilitary

forces, if these are judged to be trained and equipped for military operations; and military space activities. Such expenditures include military and civil personnel, including retirement pensions of military personnel and social services for personnel; operation and maintenance; procurement; military research and development; and military aid (in the military expenditures of the donor country). This variable is denoted *Military* and the coefficient of correlation (- 0.133) indicates a negative and weak relationship. A priori that contradicts the result of Mauro (1998) which found a positive correlation between corruption and military expenditures. In addition, the data concerning these five variables composing the Z vector are obtained via The World Bank. The parameter γ_1 is the vector of public expenditures (Z) coefficients to be estimated. Moreover, the model (3) integrates two *dummy* variables represented by the vector (Φ). The vector of coefficients is denoted γ_2. The first *dummy* variable is represented by the ethnolinguistic fractionalization (*fractionalization*). This variable measures the probability that two randomly selected persons from a given country will not belong to the same ethnolinguistic group. Many studies support that this variable has a positive effect on corruption and bad governance [Mauro (1998), Alesina (2003)]. According to Shleifer and Vishny (1993), this variable is a good instrument because more fractionalized countries are also those having dishonest bureaucracies. An empirical study carried out by Johnston (1983) also concluded that the religion has a positive impact on corruption. Data concerning this variable vary from 0 to 1. However the more a country is fractionalized, the more its fractionalization index is relatively close to 1. Indeed for the *dummy*, one allots 1 when the index is greater than 0.5 and 0 so not. Data relative to this variable are obtained via Taylor and Hudson (1972). The second *dummy* refers to colonization (*Colony*). According to Mauro (1998), it is possible that countries that have been colonized had difficulties in develop efficient institutions. For this *dummy* variable, one regards as countries colonized, those having recovered their independence after 1945. For these countries, 1 is allotted to the variable. Countries that have been independent after 1776 are regarded as not being a colony. For these cases, 0 is allotted to the variable. Data regarding countries independence date are obtained via *Encyclopaedia Britannica*. Thus, this variable should have a positive impact on corruption. Graph 6 highlights the effect of each explanatory variable described in this sub-section on the endogenous one. Table 7 shows the summary of the descriptive statistics of these variables.

3.3. Empirical results

Table 6 summarizes the cross-sectional estimates of model (3). The results of these regressions are in logarithm because they are more relevant.

Regression (17) estimates corruption index with respect to public expenditures taken into account by model (3). According to the results of this regression, all these explanatory variables have a positive effect on corruption except for military expenditures. The estimated coefficient of *Health* variable is of 0.31 and is statistically significant. However any 1 % increase on average in its standard deviation (passing on average from 12.37 to 12.5), involves in its turn a rise of the level of corruption which passes on average from 5.48 to 5.17. The results also indicate that the estimated coefficient of *Secondary* variable is positive but not significant; while that of *Subtransfer* variable (0.325) is very significant. Thus, when the proportion of transfers and subsidies allocated by government increases by 1 % in standard deviation (spending on average from 19.9 to 20.1 % of public expenditure), that results in an aggravation of the level of corruption whose median value passes from 5.48 to 5.15. The estimated coefficient of the variable that symbolizes the government final consumption is also positive and statistically significant with the threshold of 5 %. That means that any increase in this proportion involves more corruption. More precisely, to 1 % of increase in this proportion (from 16.42 to 16.6 % of GDP) is associated an increase in the level of corruption which passes on average from 5.48 to 5.7. One can notice that the estimated coefficient of the variable symbolizing military he expenditures, is not significant. The adjusted-R² is about 0.58, one can note that the explanatory power of the model seems overall appreciable. In addition, in regressions (18) and (19), the model (3) tries to take into account the *dummy* variables as instruments. In both cases, the estimated coefficients of the two *dummies* are positive and significant with the standard threshold of 5 %. This result logically confirms the theories according to which these variables would have a positive effect on the level of corruption [Shleifer and Vishny (1993), Mauro (1998), Alesina (2003)]. In the precise case of regression (19), 0.16 and 0.18 are respectively the estimated coefficients of *Factionalization* and *Colony* variables. These results make it possible to conclude this: when a country is

fractionalized[5], this fact involves a priori an increase in the mean level of corruption which passes to 4.32. This intuition is the same one for countries having been colonized. In this case, the mean level of corruption falls on a level of 5.3. One can also note a certain improvement of the explanatory power of the model which is now of 62 %.

Conclusion

The lessons to be draw from this thesis are twofold. First, corruption is an institutional problem because the failure of institutions in their entirety, has fed this phenomenon. This view is also widely shared by many economists [Amundsen (1997), Kaufmann *et al.* (1998), Ackermann (2002), Aidt (2009)]. However, other authors argue that the trend of corruption can be reversed only through democratization. Though the latter has virtues, studies show that it could also foster the emergence of corruption [Amundsen (1997)]. Secondly, corruption is an economic problem. Under the economic prism, a considerable number of studies also attempt to provide answers. This idea is tested in assumption 1 of the empirical study carried out in this document. The results lead to the fact that corruption affects economic growth. These conclusions corroborate the results of [Mauro (1995, 1997), Pellegrini *et al.* (2004), Aidt (2009)]. However, some interrogations remain still unsolved. Indeed, assumption 2 made it possible to highlight the impact of some variables known as corruption's transmission channels. This idea is tested in assumption 1 of the empirical study carried out in this document. The results lead to the fact that corruption affects the economic growth. These conclusions corroborate the results of several surveys [Mauro (1995, 1997), Pellegrini *et al.* (2004), Aidt (2009)]. However, of the interrogations remain still unsolved. Indeed, assumption 2 made it possible to highlight the impact of the variables known as corruption's transmission channels. However, it is difficult to define the direction of causality. For example, actually does the fall of the level of investment involve the aggravation of corruption, because of the decrease in incomes which results from it? On the other hand, one can as imagine as the existence of a certain level of corruption, is capable to discourage investments (in particular FDI) and then to influence economic growth and incomes. This intuition can also be imagined with a variable different from investment; in particular political instability, commercial restrictions for examples. In addition, assumption 3 confirms that corruption can influence the composition of government expenditures well. It appears on this

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[5] In this study, one assumes that a given country is fractionalized when its ethnolinguistic fractionalization index is greater than 0.5.

level that the effects vary from a given expenditure to another one as underlined by Mauro (1998). However, on this level also, one could put the question to know why certain sectors of the public administration support more corruption than others. Indeed, these various interrogations can be the subject of further research.

4. Appendix

Table 1: Model (1) estimate with random estimator

Dependent variable: $\Delta \ln(G^i)$	(1)	(2)	(3)	(4)
Intercept	0.176**	0.045***	0.118	0.04
	(0.056)	(0.0064)	(0.082)	(0.1)
$\ln(Y_{1995})$	-0.034**		-0.05*	-0.027
	(0.0125)		(0.021)	(0.028)
Investment			0.001**	0.001**
			(0.0003)	(0.0003)
Ln(Schooling)			0.019**	0.017**
			(0.0069)	(0.007)
Openness			0.00022**	0.0004**
			(0.0001)	(0.0001)
Pstability			0.0023	0.0046
			(0.003)	(0.0035)
Unemployment			0.002**	0.0016**
			(0.00056)	(0.00058)
Corruption		-0.003***		-0.0022
		(0.001)		(0.002)
N	23	23	23	23
Adjusted R-squared	0.06	0.1	0.41	0.42

Notes: One-way random effect model estimation with annual GDP per capita growth rate as dependent variable. The following superscripts "***", "**", "*", ".", " " correspond to a 0.1, 1, 5, 10 and 100% of significance, respectively. Standard errors are in parenthesis under the coefficients.

Table 2: Model (1) estimate with GLS estimator

Dependent variable: $\Delta \ln(G^i)$	(5)	(6)	(7)	(8)
Intercept	0.195***	0.041***	0.205**	0.12
	(0.048)	(0.005)	(0.064)	(0.078)
$\text{Ln}(Y_{1995})$	-0.038***		-0.0682***	0.044*
	(0.011)		(0.0162)	(0.021)
Investment			0.0008**	0.0006*
			(0.00027)	(0.00027)
Ln(Schooling)			0.021***	0.021***
			(0.0056)	(0.0054)
Openness			0.00011 .	0.00011 .
			(0.000059)	(0.000056)
Pstability			0.0045*	0.0068**
			(0.0023)	(0.0024)
Unemployment			0.0015**	0.0013**
			(0.00047)	(0.00045)
Corruption		-0.003***		-0.0027*
		(0.001)		(0.0014)
N	23	23	23	23
Multiple R-squared	0.125	0.147	0.441	0.45468

Notes: Generalized Least Squares (GLS) estimation with annual GDP per capita growth rate as dependent variable. The following superscripts "***", "**", "*", ".", " " correspond to a 0.1, 1, 5, 10 and 100% of significance, respectively. Standard errors are in parenthesis under the coefficients.

Table 3: Descriptive Statistics (23 countries)

Variables	Mean	Min	Max	Standard deviation
$\Delta \ln(G^i)$	0.025	-0.006	0.0813	0.0174
$\ln(Y_{1995})$	4.481	4.163	4.774	0.166
Investment	29.27	20.39	51.87	5.705
Schooling	46.11	14.39	90.22	18.82
Openness	69.93	19.82	161.02	28.51
Pstability	0.6895	-1.59	1.620	0.726
Unemployment	7.132	2.233	19.233	3.7056
Corruption	6.630	2.467	9.933	2.289

Table 4: Model (2) estimate with random estimator

Dependent variables:	(9) Investment	(10) Schooling	(11) 0penness	(12) Pstability
Intercept	-25.76 (30.52)	-546.7*** (70.61)	-605.22*** (130.1)	-0.35 (2.5)
$\ln(Y_{1995})$	12.8 . (7.3)	136.3*** (16.9)	161.2*** (30.4)	-0.06 (0.6)
Corruption	-0.35 (0.56)	-2.72* (1.3)	-7.17** (2.46)	0.2*** (0.05)
N	23	23	23	23
R²-Ajusté	0.04	0.47	0.23	0.21

Notes: One-way random effect model estimation with corruption's transmission channels as dependent variables. The following superscripts "***", "**", "*", ".", " " correspond to a 0.1, 1, 5, 10 and 100% of significance, respectively. Standard errors are in parenthesis under the coefficients.

Table 5: *Model (2) estimate with GLS estimator*

Dependent variables:	(13) Investment	(14) Schooling	(15) 0penness	(16) Pstability
Intercept	3.68 (28.83)	-346.5*** (45.046)	355.7*** (84.54)	2.71 (2.26)
$Ln(Y_{1995})$	6.12 (6.94)	88.03*** (10.33)	-66.79*** (19.3)	-0.78 (0.53)
Corruption	-0.30 (0.50)	-0.516 (0.483)	1.695* (0.79)	0.21*** (0.03)
N	23	23	23	23
R²-Ajusté	0.045	0.58	0.12	0.37

Notes: Generalized Least Squares (GLS) estimation with corruption's transmission channels as dependent variables. The following superscripts "***", "**", "*", ".", " " correspond to a 0.1, 1, 5, 10 and 100 % of significance, respectively. Standard errors are in parenthesis under the coefficients.

Table 6: Cross-sectional estimation of model (3)

Dependent variable: Ln(Corruption)	(17)	(18)	(19)
Intercept	-0.70**	-0.992***	-0.99***
	(0.213)	(0.223)	(0.221)
Ln(Health)	0.31***	0.334***	0.382***
	(0.0475)	(0.047)	(0.051)
Ln(Secondary)	0.035	0.013	-0.016
	(0.053)	(0.052)	(0.053)
Ln(Subtransfer)	0.325***	0.365***	0.405***
	(0.05)	(0.049)	(0.052)
Ln(Fconsump)	0.212*	0.26**	0.202*
	(0.09)	(0.09)	(0.092)
Ln(Military)	-0.07	-0.082	-0.1
	(0.06)	(0.057)	(0.057)
Fractionalization		0.225***	0.16*
		(0.064)	(0.071)
Colony			0.179*
			(0.083)
N	210	210	210
Adjusted R-squared	0.588	0.607	0.624

Notes: Cross-sectional estimation with corruption perception index (CPI) as dependent variable. The following superscripts "***", "**", "*", ".", " " correspond to a 0.1, 1, 5, 10 and 100% of significance, respectively. Standard errors are in parenthesis under the coefficients.

Table 7: Descriptive Statistics (35 countries)

Variables	Mean	Min	Max	Standard deviation
Corruption	5.48	1.69	9.9	2.66
Health	4.69	0.42	9.93	2.38
Secondary	22.75	3.28	74.2	12.37
Subtransfer	47.6	2.92	81.99	19.9
Fconsump	16.42	3.14	28.03	5.35
Military	2.150	0.40	7.06	1.05
Colony	0.28	0.00	1.00	0.45
Fractionalization	0.228	0.00	1.00	0.42

The 23 OECD countries covered by the study (section 1 and 2 of the empirical part):

AUSTRALIA, CANADA, CHILE, CROATIA, CZECH REPUBLIC, DENMARK, GREECE, HUNGARY, ICELAND, ISRAEL, JAPAN, KOREA. REPUBLIC, MEXICO, NEW-ZEALAND, NORWAY, POLAND, SLOVAK.REPUBLIC, SLOVENIA, SWEDEN, SWITZERLAND, TURKEY, UNITED-KINGDOM, UNITED STATES.

The 35 countries covered by the study (section 3 of the empirical part):

ARGENTINA, AUSTRALIA, BELGIUM, BOLIVIA, BRAZIL, BULGARIA, BURUNDI, CAMEROON, CHILE, COLOMBIA, DENMARK, FINLAND, FRANCE, GERMANY, GUATEMALA, GUINEA, HUNGARY, INDIA, ITALY, KENYA, MALAYSIA, MOROCCO, NETHERLANDS, NEW ZEALAND, NORWAY, PARAGUAY, PERU, PORTUGAL, SOUTH AFRICA, SPAIN, SWEDEN, SWITZERLAND, UNITED STATES, UNITED KINGDOM, URUGUAY.

Graph 4: Average countries' CPI
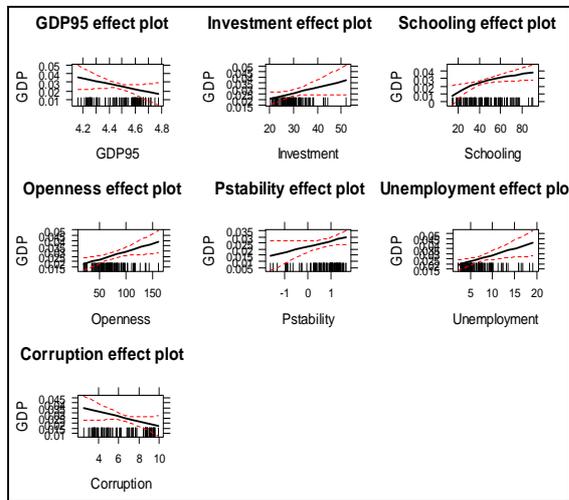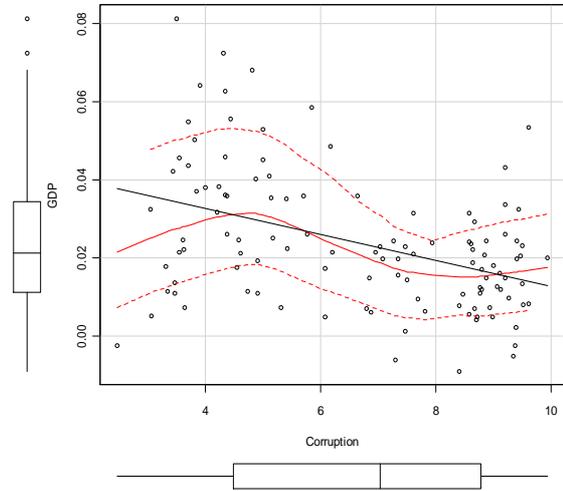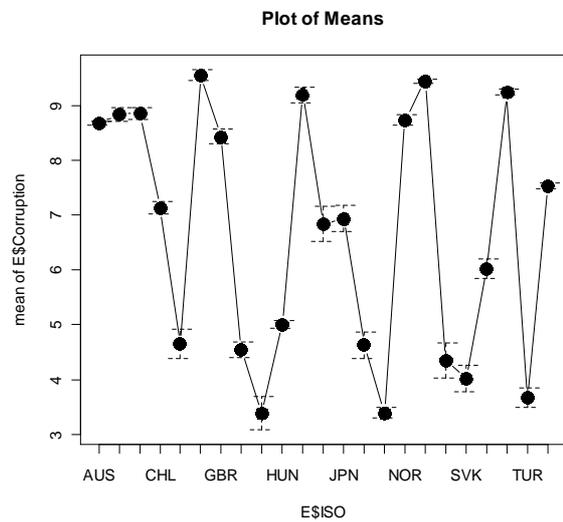
Graph 2: Boxcox Transformation
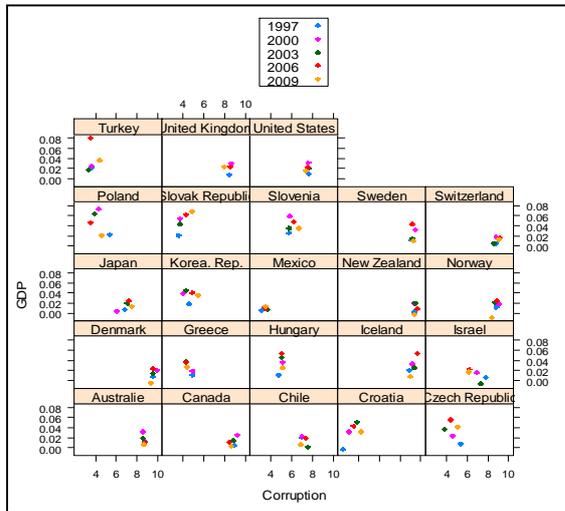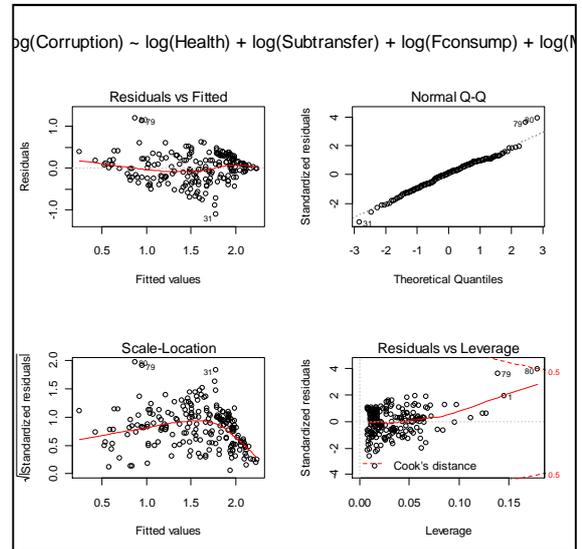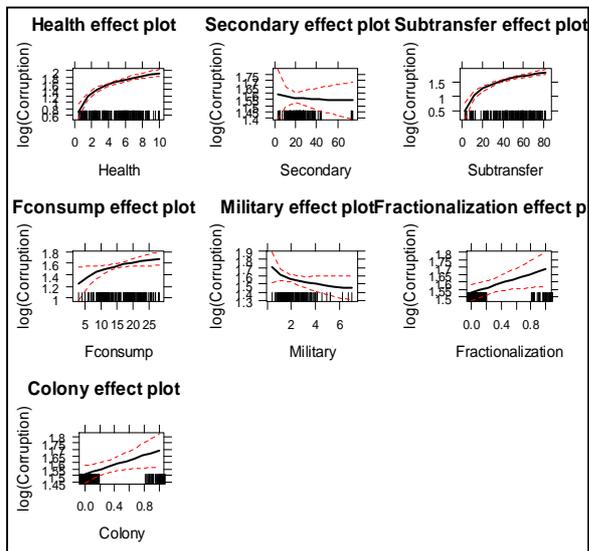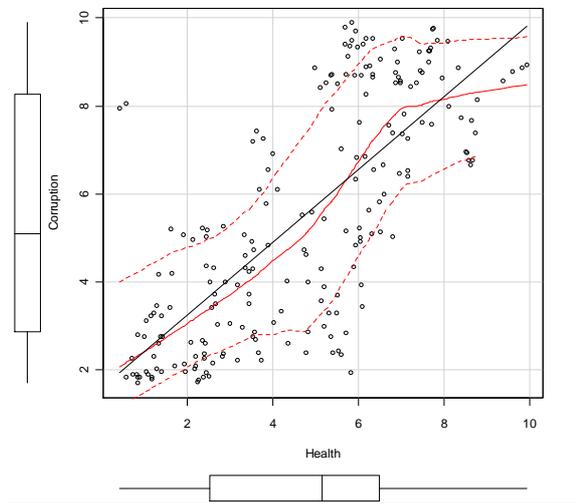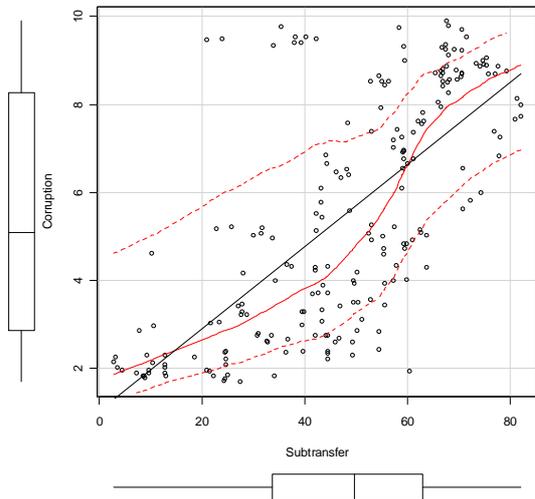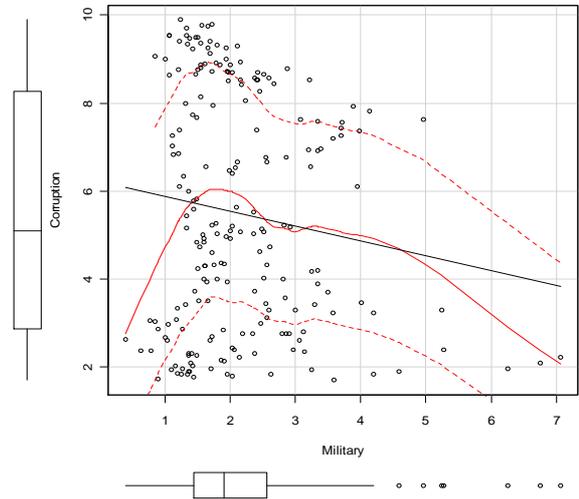
Graph 9: Corruption vs gouvernement final consumption expenditures
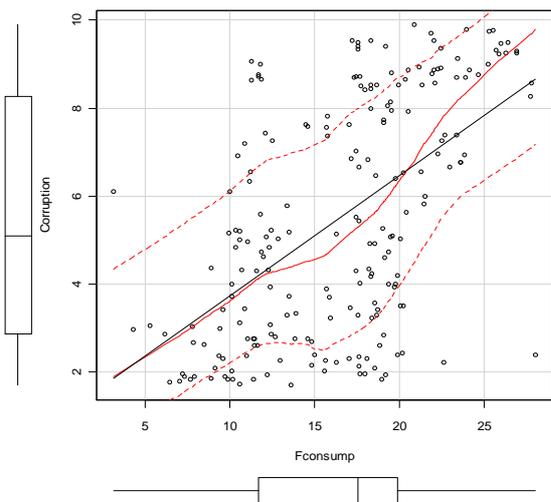
Graph 11: Corruption vs education expenditures in Secondary
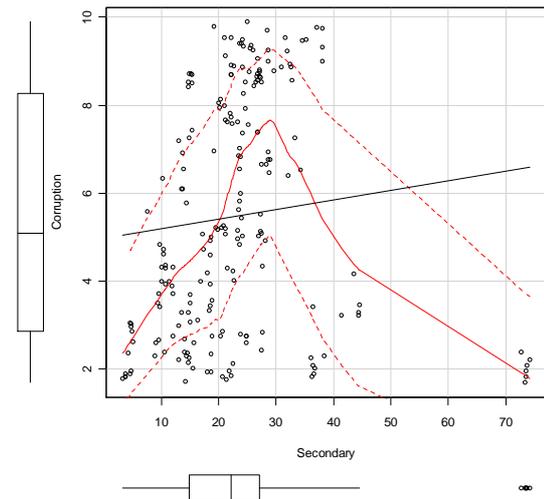
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