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**ORGANIZED CRIME AND CORRUPTION:**  
**A THEORETICAL AND EMPIRICAL ANALYSIS**

Tesi presentata da

**Maria Paola Rana**

*Relatore*

**Prof. Beniamino Moro**

*Coordinatore:*

**Prof. Romano Piras**

*Commissione d'esame*

**Prof. Salvatore Capasso**  
**Prof. Maurizio Ciaschini**  
**Prof. Beniamino Moro**

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## Abstract

Nowadays a large part of academic literature and international organizations largely and increasingly recognize that corruption acts as a major impediment to growth. However, there are still some doubts and large room to further investigate the economic consequences of corruption. Very recently, the most important international agency focused on fighting corruption (Transparency International) has underlined the importance to better understand the links between corruption and organized crime and their combined effects on economic growth. The purpose of our research is to further investigate these issues, both theoretically and empirically. More precisely, thinking about the phenomena of corruption and organized crime, the questions we try to answer through our research are: *i)* is there some relationship between the two phenomena? *ii)* if yes, can we explain this relationship using a theoretical model? *iii)* can we find appropriate proxies and indexes of organized crime and corruption in order to empirically test the theoretical model described in point *ii)*? and moreover: *iv)* is there some possibility to solve the doubts about the economic effects of corruption taking into account the relationship between the two phenomena? These are the main questions which lead our research and that we try to answer in this dissertation. Clearly, in order to better understand these questions and related answers, a detailed literature review of theoretical and empirical studies on corruption, crime and organized crime will be presented (Chapter 1). Then, we develop a simple theoretical framework which analyses the effects of the two phenomena on the economy and empirically test the effects of the two illegal activities on the economic growth of Italian regions (Chapter 2 and Chapter 3 respectively).

# INTRODUCTION

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## INTRODUCTION

Nowadays, a large part of academic literature and international organizations largely and increasingly recognize that corruption acts as a major impediment to growth. The World Bank (2000), for example, identified corruption as “*the single greatest obstacle to economic growth and social development in the third world countries*”, as it distorts the rule of law and weakens the institutional foundations on which economic growth depends. In fact, though corruption is present in almost every country, it has the most devastating effects in developing economies, since it obstructs any advance in economic growth. It has been demonstrated, for example, that an improvement in a country of 6 points on the Transparency International Corruption Perception Index, may increase GDP by more than 20% (Lambsdorff, 2004).

In what follows we will briefly review the definition of corruption, its measures and the existing literature on the effects of this phenomenon on economic growth. As we will see, this literature is vast. However, there are still some doubts, especially with regard to the effects of corruption on foreign direct investment (FDI) and the so called East Asian Paradox. Additionally, of particular interest is the existence of some links between corruption and organized crime and their combined effects on economic growth and development. As we largely discuss through the essay, the purpose of our research is to further investigate these issues, both theoretically and empirically. Clearly, in order to better understand the problems discussed, a detailed literature review of theoretical and empirical studies on crime will be presented.

The phenomenon of organized crime exists in almost every country in the world. In fact, other than the well-known Italian and American mafias, examples include the Yakuza in Japan, the Triads in Hong Kong, Green Gang in Shanghai, Colombian and Mexican drug cartels, numerous grouping in post-Soviet states, youths gangs in Los Angeles, New York,

Soweto and San Paolo. Then, the phenomenon is more widespread than one could imagine, and it affects the economies of countries in a way that needs to be better understood. Nowadays it is well-recognized that organized crime can obstruct economic growth and development, however only a few empirical and theoretical studies have analyzed the economic effects of this phenomenon. As we will see, there is still large room in the literature for further research on organized crime.

Moreover, thinking about the phenomena of corruption and organized crime, the questions we would like to answer through our research are: *i)* is there some relationship between the two phenomena? *ii)* if yes, can we explain this relationship using a theoretical model? *iii)* can we develop a macroeconomic theoretical model which is able to demonstrate the effects of the two phenomena, jointly considered, on economic growth? *iv)* can we find appropriate proxies and indexes of organized crime and corruption in order to empirically test the theoretical model described in point *iii)*? and moreover: *v)* is there some possibility to solve the doubts about the economic effects of corruption taking into account the relationship between the two phenomena? These are the main questions which lead our research.

The dissertation is organized as follows: the first chapter presents a detailed literature review on corruption and organized crime; the second chapter is a simple theoretical framework which analyses the effects of corruption and organized crime on the economy; the third chapter is an empirical analysis of the effects of corruption and organized crime on the economic growth of Italian regions.

## CHAPTER 1

# CORRUPTION AND ORGANIZED CRIME: A LITERATURE REVIEW

### 1. Definition, measurement and causes of corruption

This section will try to clarify the meaning of corruption, and the different indexes that are being used to measure it, or better to measure the perceptions of it. Moreover, we will analyze the causes of corruption, which can be categorized into four main factor-groups, specifically: political and judicial factors; historical factors; social and cultural factors and economic factors. This introductory section will be really useful for a full understanding of the phenomenon of corruption and its impacts on economic growth.

#### 1.1. The definition of corruption.

One of the difficulties of studying corruption lies in defining it. While it may appear to be a semantic issue, how corruption is defined actually ends up determining what gets modeled and measured<sup>1</sup>. Although it is difficult to agree on a precise definition, in most cases different observers would agree on whether a particular behavior connotes corruption. In this sense corruption is like an elephant: “*even though it may be difficult to describe, it is generally not difficult to recognize when observed*” (Tanzi, 1998: 8). Unfortunately, the behavior is often difficult to examine directly because, typically, acts of corruption do not take place in broad daylight (Tanzi, 1998).

The most popular and simplest definition of corruption identifies it as “*the abuse of public power for private benefit*”. This is the definition used by the World Bank<sup>2</sup>. From this definition it should not be concluded that corruption exists only in the public sector, but rather that corruption in the public sector is more important for the purposes of public policy in developing economies and the public sector should take the lead in establishing high standards of honesty and liability. However, corruption can be found also in the private sector, especially in large private enterprises, as for example in procurement or even in hiring. The phenomenon also exists in private activities regulated by the government. A firm, in fact, could have an incentive to offer a bribe or accept paying a bribe to obtain benefits that would not be accessible without corruption, such as being granted a contract, or avoid having to comply with regulations or taxes (Boddewyn, 1988; Boddewyn and Brewer, 1994). Additionally, as underlined by Tanzi (1998), in several cases of corruption, the abuse of public power is not necessarily for one's private benefit but it can be for the advantage of one's party, class, tribe, friends, family, and so on. In fact, in many countries some of

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<sup>1</sup> One sign of the difficulty of defining corruption is that almost everyone who writes about it first tries to define it. For a brief summary of various definitions, see Jain (1998: 13-19). For a discussion of the importance of the definition of corruption, see Johnston (2000a); Lancaster and Montinola (1997) and Philp (1997). Collier (1999: 4) attributes the absence of a theory of corruption partly to the lack of an agreement upon the definition of corruption. (all cited in Jain, 2001).

<sup>2</sup> “A more neutral definition is that corruption is the intentional noncompliance with arm's length relationship aimed at deriving some advantage from this behavior for oneself or for related individuals” (Tanzi, 1995). For other definitions, see Theobald (1990), cited in Tanzi (1998).

the incomes from corruption go to finance the political parties.

Additionally, as Jain (2001) has observed, certain illegal acts such as fraud, money laundering, drug trades, and black market operations, do not constitute corruption in themselves because they do not involve the use of public power<sup>3</sup>. However, people who undertake these activities must often involve public officials and politicians if these operations are to survive and therefore these activities rarely prosper without widespread corruption<sup>4</sup>. Moreover, even in their simplest forms, these acts can influence government policy.

Tanzi (1998) notes that not all acts of corruption result in the payment of bribes. For example, a public employee who claims to be sick but goes on vacation is abusing his public position for personal use. Thus, he is engaging in an act of corruption even though no bribe is paid. Or, the president of a country who has an important airport built in his small hometown is also engaging in an act of corruption that does not involve the payment of a bribe. So, it is clear how it could become really difficult to draw a distinction between some forms of rent seeking activities and corruption. Furthermore, Tanzi (1998) underlines that, in many instances, bribes can be camouflaged as gifts, but actually they must be distinguished. This indicates that the identification of a bribe may not always be simple, and consequently also the identification of corruption.

Another important definition of corruption is that made by El- Rufai (2002), who believes that corruption covers a broad range of social misconducts ranging from considerable fraud, extortion, misappropriation, bribery, nepotism, conferring of favors to friends, supports of elections, abuse of public property, and so on. Blackburn *et al.* (2006) describe corruption as a “clandestine activity which takes place away from the glare of publicity and which, therefore, is difficult to measure empirically”. Carefully, Rose-Ackerman (1999) laments that corruption exists when institutions established to regulate the interrelationships between the citizens and the state, are used instead for personal enrichment and provision of benefits to the corrupt and undeserving.

So, we can conclude that it is really difficult to give a specific definition to corruption, but while there is no agreement in the literature on how to define the phenomenon of corruption, one thing is clear: corruption is a governance problem. Corruption is a result of weak state management and exists when individuals or organizations have monopoly power over a good or service, discretion over making decisions, limited or no responsibility, and low levels of income (Klitgaard, 1988). Here we will refer to the frequently cited World Bank (1997a) definition of corruption as “*the abuse of public office for private gain*”.

## **1.2. Measurements of corruption**

Besides the difficulties of defining corruption, there is the problem of measuring it. By its nature

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<sup>3</sup> No one, however, can deny that some of these phenomena are closely connected to corruption. Vogl (1998: 32), for example, highlights the importance of combating money laundering. Naylor (1987, 1996) links the drug trade, black markets and corruption.

<sup>4</sup> Illustrations provided by Naylor (1998), in fact, demonstrate that the distinction between “illegal activities” and “corrupt activities” is sometimes not very precise.

corruption would be difficult to measure since it is carried out, in most cases, clandestinely and away from the public eye and records. “If corruption could be measured, it could probably be eliminated” (Tanzi, 1998: 20). In fact, notionally it is not even clear what one would want to measure. Simply measuring bribes paid would ignore a whole range of corrupt acts which are not accompanied by the payment of bribes<sup>5</sup>. If one attempted to measure acts of corruption rather than the amounts of bribes paid, he probably would count many relatively unimportant actions, he would have to identify each act, and, in any case, he would not have the information. Jain (2001) suggests that a researcher trying to develop quantitative measures of corruption has to struggle with the question of what will be included in such a measurement, and then try to measure something that those who know about are trying to hide. Johnston (2000b) provides a detailed discussion of challenges involved in measurement and analysis of indices of corruption.

In spite of the difficulties, there have been several attempts to measure corruption. Most of these attempts are based on the assumption that it is not possible to measure corruption, but it is possible to measure perceptions of it. In fact, while there are no direct ways of measuring corruption, there are several indirect ways of getting information about its prevalence in a country or in an institution. Some useful information can be obtained from:

-Reports on corruption available from published sources including newspapers. The Internet is becoming a progressively more precious source. Newspapers such as *Le Monde*, *The Financial Times*, and *The New York Times*, and magazines such as *The Economist* and *The Far Eastern Economic Review* have been reporting many articles on corruption.

-Case studies of corrupt agencies such as tax administrations, customs, police or some other institutions. However, while there are many of such studies, often the reports are internal and are reserved confidential.

-Questionnaire-based surveys. These surveys *measure perceptions of corruption rather than corruption per se*. Several business-risk analysts and polling organizations regularly construct indices of “perceived” corruption, based on surveys responses of business people, country experts, and local residents. These indices, typically, measure corruption by asking those surveyed to score a country, with respect to the probability that government officials would demand bribes. The four most popular of these indices are the Corruption Perceptions Index (CPI) constructed by Transparency International<sup>6</sup>; the International Country Risk Guide index (the ICRG index)<sup>7</sup>; the Business International index (BI index)<sup>8</sup>; and the control of corruption index (WB index) from the “Governance Matters” database at the World Bank (Kaufmann *et al.*, 2005).

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<sup>5</sup> Since October 1999, Transparency International publishes a survey: the “*Bribe Payers Survey*” report, which looks in detail at the sources of corruption in the international marketplace, both in terms of where the bribes are paid and by which businesses. Above all, the *Bribe Payers Survey* illustrates how the supply of corruption is viewed by a global selection of senior business executives, who understand the markets and market pressures in their own countries, some of which drive corruption.

<sup>6</sup> Lambsdorff (1998) describes how this index is created as well as some problems with previously available indices of corruption. Kaufmann (1998) and Johnston (2000b) discuss some problems with this index (cited in Jain, 2001: 76).

<sup>7</sup> Tanzi and Davoodi (1997) have described and used this index.

<sup>8</sup> Mauro (1995) may have been the first to use BI data for empirical analysis. Ades and Di Tella (1997a) provide some details of these ratings.

A major problem with all these perception-based indices is that they do not measure real corruption, but only rely on perceptions. In other words, it is important to keep in mind that they reflect perceptions and not objective and quantitative measures of actual corruption. It is fairly possible that these perceptions are influenced not only by conventional wisdom about how institutions and cultures may be conducive to corruption, but also by the economic performance of the country being evaluated. Another major limit of the perception-indices is that there are inconsistencies over time in the way that they are constructed and that the time-span for which they are available is relatively short<sup>9</sup>. However, correlations between various indices tend to be very high, providing some support for the argument that survey data on corruption may provide reliable estimates of the real phenomenon. Moreover, in spite of the objections to these measures of corruption, authors like Mauro (1995) and Knack and Keefer (1995) pioneered the use of the perception- indexes for empirical analysis. Since then, most researchers have used a combination of these measures to estimate the relationship between corruption and a multitude of other variables (i.e., investment, FDI, government expenditure, and so on). This is the main reason that lead us to concentrate on the perception-indices, especially the CPI, rather than on other variables.

However, for a complete exposition, we have to underline the fact that some of the most recent scholars think that perception-based indices might not be a good indicator of actual corruption in a country. Strongly persuaded of this, Kaufmann *et al.* (1999) have created an aggregate measure combining the following three elements of governance: probity, bureaucratic quality and the rule of law<sup>10</sup>. Their aggregation process addresses some of the problems associated with survey data like those collected by *Transparency International*. Interestingly, Dreher *et al.* (2007) derived an index of corruption from a structural equation model that treats corruption as a latent variable, that is directly related to its underlying causes and effects.

Very recently, Aidt (2009) used the WBES index in his empirical analysis of the effects of corruption on economic development. This alternative cross-national index has been provided by the World Business Environment Survey (WBES) conducted in 1999-2000. The index is based on survey responses of managers living and working in particular countries about their own experience with corrupt officials. Therefore, it claims to measure real, as opposed to perceived, corruption<sup>11</sup>. While this index avoids some of the potential biases associated with the perception-based indices, it is obvious that managers may have incentives to understate their direct experience with corruption. Treisman (2007) showed that the correlation between the two types of indices (perception-based indices and WBSE index) is very weak and that many of the standard predictors of perceived corruption, such as democracy and press freedom (Treisman, 2000; Paldam, 2003), are mostly unrelated to the WBES index.

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<sup>9</sup> The ICRG and BI indexes are available since the early 1980s, the CPI and WB indices are available since the mid-1990s.

<sup>10</sup> According to them, since corruption is one aspect of what constitutes governance, some of the researches on corruption could be extended to the aggregated concept of governance.

<sup>11</sup> At the national level several other objective measures of corruption are available. These include data on the number of officials convicted for corruption (see, e.g., Alt and Lassen, 2003 for a study of US states; and Del Monte and Papagni, 2001 for a study of Italian regions) and data on the amount of leakage from infrastructure projects in Italian regions (Golden and Picci, 2005).

However, in spite of the objections, the most used index of corruption is the *Corruption Perceptions Index* (CPI), which ranks countries in terms of the degree to which corruption is perceived to exist among public officials and politicians. It is a composite index, which makes use of surveys of business people and assessments by country analysts. The strength of the CPI lies in the combination of multiple data sources in a single index, lowering the probability of misrepresenting a country's level of corruption. The CPI 2007 ranks 180 countries (an increase from 163 countries in 2006), and draws on fourteen different polls and surveys from twelve independent institutions, using data published or compiled between 2006 and 2007.

The CPI assesses the perception of corruption on a scale of 0 to 10: ten refers to a corruption-free country, and zero refers to a country where most transactions or relations involve corruption. *Table 5 in Appendix* shows the indexes for 1996, 1997, 2006/07/08 provided by Transparency International. The CPI 2007 shows seven out of every ten countries (nine out of every ten developing countries) with an index of less than 5 points out of 10 (*Transparency International, 2008: Global Corruption Report: 297-320*).

The CPI is not capable of answering whether the world as a whole is improving or not in terms of perceived corruption, but it can reveal whether regions or groups of countries are improving relative to each other. The analysis shows that poorly scoring countries tend to have difficulties escaping a downward trend. Generally we can say that countries normally hold their positions over the period (as clearly shown by *Table 5 in Appendix*). And when there are changes, how closely changes in these indexes reflect real changes within given country is an important, open question. A single but widely reported case of corruption may easily change perceptions in a given country and lead to an index that may not correctly assess corruption in that country (Tanzi, 1998).

### **1.3. The causes of corruption**

The causes of corruption can be categorized into four main factor-groups, specifically: political and judicial factors; historical factors; social and cultural factors and economic factors. Below we will analyze in detail these different causes.

#### **1.3.1. Political Factors**

The political factors capture the democratic environment and political stability of a given country, the effectiveness of its judicial system and the origin of its legal system.

##### ***1.3.1.a. The democratic environment***

The role of democracy has been highlighted in several studies of corruption<sup>12</sup>. It is widely believed

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<sup>12</sup> See, among others, Treisman (2000) and Paldam (2003).

that corruption is related to the deficiencies of the political system and that democracy, by promoting political competition and hence increasing transparency and liability, can provide a check, although an imperfect one, on corruption. Freedom of association and of the press, in fact, stimulate public interest groups and reporters to expose abuses. Moreover, greater civic engagement may lead to closer monitoring. In democratic systems, in addition, competitors for office have an incentive to discover and publicize the misuse of office whenever an election beckons. For all these reasons, the risk of exposure may be higher in more democratic, open political systems (see e.g., Diamond and Plattner, 1993)<sup>13</sup>.

However, Treisman (2000) argued that the fact that a country is democratic today makes just about no difference to how corrupt it is perceived to be. What matters is whether or not it has been democratic for decades. His regression estimates suggest a painfully slow process by which democracy undermines the foundations of corruption. Those countries with at least forty years of consecutive democracy enjoyed a significant, though small, improved corruption dividend, and those with 20-30 years may also have benefited slightly.

Other characteristics of the political environment, including electoral rules and the degree of decentralization<sup>14</sup>, may also be important in explaining corruption.

### ***1.3.1.b. Political stability***

Also political instability may matter for corruption, the expectation being that more unstable countries will have higher levels of perceived corruption. As Treisman (2000) put it, besides the probability of getting caught, officials will consider the consequences if they do. The punishments for criminal malfeasance are obviously relevant. Short of prosecution, offenders are likely to lose their job, whether by recall, if elected, or dismissal, if appointed. The cost this involves depends upon the benefits provided by that job, such as the level of salaries in public office and the length of time for which an honest official could expect to enjoy them (Becker and Stigler, 1974; Van Rijckeghem and Weder, 1997; Ul Haque and Sahay, 1996; World Bank, 1997b). A high degree of political stability will lengthen officials' time horizon, and a bureaucracy that offers long-term careers with chances of advancement will promise greater future benefit to a low-level bureaucrat than one in which jobs are more insecure and promotion less likely (Rauch and Evans, 1997). Besides losing their job, corrupt officials often face social dishonor if exposed to a degree that depends upon the prevailing norms and expectations within the culture<sup>15</sup>. From all of these arguments, Treisman (2000) derived the hypothesis that corruption will be higher where political instability is greater, however he found little support for this. We will return to this argument in the final section.

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<sup>13</sup> However, as Geddes (1997) and Heywood (1996) have pointed out, electoral competition may create other incentives for corruption: the need to raise campaign funds can lead to abuses of power not to benefit the individual but the private interests of a party.

<sup>14</sup> Treisman (2000), and Fisman and Gatti (2002).

<sup>15</sup> Various authors have suggested that in traditional societies, where the lines between public and private are less clearly drawn and where tribute giving is not clearly distinguished from bribery, the social stigma may be lower, or non-existent at all (Myrdal, 1970: 237; Ekpo, 1979).

### ***1.3.1.c. The judicial system and the origin of the legal system.***

The judicial system is also expected to play a role in controlling corruption (Becker, 1968). The role of the legal system and the rule of law have featured significantly in many studies on the quality of governance and its consequences for development<sup>16</sup>. Strong legal foundations and efficient legal systems protect property rights and provide a stable environment for economic activity. Failure of the legal system to provide for the enforcement of contracts undermines the operation of the free market and, in turn, reduces the incentives for agents to participate in productive activities. But legal systems may differ in the degree to which property rights are protected and in the quality of government they provide. Empirical work suggest that the common law system, mostly found in the colonies of Britain, appears to have better protection of property rights compared with the civil law system typically associated with the former colonies of continental Europe (La Porta *et al.*, 1999; Treisman, 2000).

To better understand the role of the legal system, we can mention Treisman (2000), who suggested to construe the official as balancing the expected cost of a corrupt act against the expected benefit. Clearly, the most evident cost is the risk of getting caught and punished. The probability of getting caught depends in part on the effectiveness of the country's legal system. Two related aspects can be distinguished. First, legal systems differ in the degree of protection and the opportunities for recourse they offer to private property owners harmed by corrupt acts of officials. La Porta *et al.* (1999) have argued that common law systems differ on this dimension from civil law systems. While the common law tradition developed first in England as a defense of parliament and property owners against the attempts by the sovereign to regulate and expropriate them, civil law systems in their Napoleonic, Bismarckian, or other forms developed more as an instrument used by the sovereign for state building and controlling economic life (La Porta *et al.*, 1999; David and Brierly, 1985). Common law developed from precedents established by judges, usually associated with the property-owning aristocracy against the Crown, while civil law developed from codes drawn up by jurists at the sovereign's request. The authors hypothesize that the greater protections of property against the state embodied in common law systems improve various aspects of government performance, including reducing corruption.

Second, legal systems differ not just in the formulations and original intent of laws but also in the prevailing expectations and practices that govern how they are enforced, what might be termed "legal culture". Conceptions of the social role of law and the relative importance of law in preserving social order vary across countries. In Britain and some of its former colonies, scholars have noted an almost obsessive focus on the procedural aspects of law. In Eckstein's words, "The British ... behave like ideologists in regard to rules and like pragmatists in regard to policies. Procedures, to them, are not merely procedures, but sacred rituals" (Eckstein, 1966: 265). By contrast, in many other cultures, social order is associated not so much with adherence to

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<sup>16</sup> See, for example, North (1990), and Easterly and Levine (1997).

procedures as with respect for hierarchy and the authority of offices. This British preoccupation with procedures has been thought by some to explain why most of the newly independent states with extended democratic experience were former British colonies (Weiner, 1987: 19; Lipset *et al.*, 1993). “A willingness of judges to follow procedures even when the results threaten hierarchy obviously increases the chance that official corruption will be exposed “ (Treisman, 2000: 6).

Thus, one might expect countries with different colonial traditions to have different legal cultures, and different degrees of vulnerability to corruption, irrespective of whether they have common law or civil law systems. As we will better analyze below, legal system and colonial experience are, of course, highly correlated<sup>17</sup>.

### **1.3.2. Historical Factors**

To a large extent, it is difficult to separate the historical factors from the political and judicial factors since the effectiveness of the judicial system is dependent on the colonial heritage of the country in question. La Porta *et al.* (1999) argue that a common law legal system is associated with superior governance, with more effective judicial systems, and with better protection of property rights compared with the civil law system. Also Treisman (2000), as seen above, explores the direct influence of historical tradition on perceived corruption, showing that countries with a history of British rule were robustly rated “less corrupt”.

Additionally, another way in which historical tradition might affect the perceived costs of corrupt actions is through the influence of religion, as discussed below.

### **1.3.3. Social and Cultural Factors**

This group of factors captures the social and cultural characteristics of a country that may impact upon the commonness of corruption in a given country, such as religion and ethnic and linguistic fractionalization.

#### ***1.3.3.a. Religion***

Religion has often been thought to condition cultural attitudes towards social hierarchy and family values, and thus it may determine the acceptability, or otherwise, of corrupt practices. In more hierarchical systems (i.e., Catholicism, Eastern Orthodoxy and Islam), challenges to the status quo are less frequent than in more equalitarian or individualistic religions, such as Protestantism<sup>18</sup>. Religions may also influence how individuals view their loyalties to family as opposed to other citizens, what Banfield (1958) has called “familism”, which, in turn, may affect the level of

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<sup>17</sup> Actually, some former British colonies do not have a common law legal system: for instance, Jordan, Egypt, Iraq, Kuwait, Malta and Mauritius. And some countries that were never British colonies have adopted common law systems, in whole or in part: Thailand, Western Samoa, Liberia, and Namibia (Treisman, 2000).

<sup>18</sup> La Porta *et al.* (1997) find evidence that hierarchical religion correlates with high perceived corruption. The classification of Catholicism, Islam, and Eastern Orthodoxy as “hierarchical religions” is taken from their paper.

nepotism .

A second way by which religion could affect corruption levels is via the historical pattern of influence that developed in different settings between church and state. According to Treisman (2000), protestant churches often developed in counterpoint rather than in fusion with the state and may thus have stimulated a more autonomous civil society. In fact, in religious traditions such as Protestantism, institutions of the church may play a role in monitoring and denouncing abuses by state officials. In other traditions, like e.g. Islam and Roman Catholicism, where church and state hierarchies are closely intertwined, such a role may be absent.

La Porta *et al.* (1999) demonstrated that religion may also impact on the quality of the legal system. In fact, they found that countries with a high proportion of Catholics or Muslims reduce the quality of government and, by extension, may reduce the prevention of corruption. The authors argued also that the percentage of Protestants in the population is a robust predictor of lower corruption. Religious fractionalization may also have an impact on corruption and other characteristics associated with the quality of government. Alesina *et al.* (2003), for example, demonstrated that religious fractionalization is positively correlated with measures of good governance.

#### ***1.3.3.b. Ethnic and linguistic fractionalization.***

Ethnic and linguistic fractionalization of a society may also contribute to the commonness of corruption in a given country. The evidence is, however, mixed. Shleifer and Vishny (1993) suggested that countries where the population consists of several different ethnic groups are more likely to be characterized by a less organized, and therefore more deleterious, type of corruption<sup>19</sup>. This hypothesis is used in Mauro (1995), where it is found that an index of ethno-linguistic fractionalization is correlated with corruption. Also, La Porta *et al.* (1999) found evidence that, in societies that are more ethno-linguistically diverse, governments exhibit inferior performance. Later, Alesina *et al.* (2003) have presented evidence that ethnic and linguistic fractionalization has a statistically significant negative impact on corruption, in the sense that countries that are ethno-linguistically diverse are associated with higher perceived levels of corruption. However, Tanzi (1994) argues that public officials are more likely to do favors to their relatives in societies where family ties are strong, and this can more likely happen in societies without, or with less, ethno linguistic fractionalization.

#### **1.3.4. Economic Factors**

The economic determinants of corruption across countries have focused typically on three factors: the degree of openness; a country's endowments of natural resources; and the size of the public sector.

##### ***1.3.4.a. The degree of openness***

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<sup>19</sup> The corruption regimes will be largely analyzed in the last section.

The trade literature suggests that trade restrictions generate a significant amount of rents and rent-seeking activities, noted by Bhagwati (1982) to include not only attempts to evade tariffs but also efforts at *premium seeking* when agents compete for premium-fetching licenses, *revenue seeking* when agents try to appropriate a share of the revenue resulting from import restrictions<sup>20</sup>, and *tariff seeking* when agents lobby for the imposition of protectionist tariffs<sup>21</sup>. Krueger (1974) estimated that rents generated by government regulations in import licenses exceeded 5 percent of national income for India in 1964 and about 15 percent of GNP for Turkey in 1968, suggesting that rents accruing from the imposition of trade regulations are both theoretically and quantitatively significant. It follows that the degree of openness to foreign trade should be an important factor in determining the level of rent-seeking activities, or the extent of corruption.

Ades and Di Tella (1996, 1999) have found that a higher degree of openness of the economy (measured on the basis of the sum of imports and exports as a share of GDP) is significantly associated with lower corruption. Also Treisman (2000) demonstrated that corruption will be lower the greater the country's exposure to competition from imports, though he argued that it is hard to be sure of the direction of causation. Later, also Wei and Wu (2001), showed evidence that countries with capital controls have higher corruption and, in turn, receive less foreign investment and are more prone to financial crisis.

However, Neeman *et al.* (2003), more recently, demonstrated that an higher level of openness will more likely increase the impact of corruption, because openness will consent to dissipate stolen money abroad<sup>22</sup>. Moreover, it must be also noted that globalization, in all its ramifications, has brought into frequent contacts individuals from countries with little corruption with those from countries where corruption is endemic. Then, openness can be seen as a factor which increases the worldwide diffusion of corruption through contagion. The growth of international trade and business, in fact, has created many situations where the payment of bribes may be highly beneficial to the companies that pay them by giving them privileged access to markets, or access to profitable contracts over competitors, or also to particular benefits such as tax incentives. In fact, when the economic operators of some countries begin to pay bribes, they put pressure on those from other

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<sup>20</sup>It means that, in the presence of quantitative restrictions on imports of a certain good, the necessary import licenses are very valuable and importers may be willing to bribe the relevant official in order to obtain them.

<sup>21</sup>Protection of home industries from international competition generates rents that local entrepreneurs may be willing to pay for, in the form of bribes. The ability of an official to provide a private partner profitable protection in some domestic market, in fact, will depend upon how open that market is to external competition from imports.

<sup>22</sup>Neeman *et al.* (2003) considered a neoclassical growth model with endogenous corruption. Corruption and wealth, were shown to be negatively correlated. Richer countries tend to be less corrupt, and corrupt economies tend to be poorer. This observation generated the following puzzle: if poorer countries do indeed experience higher levels of corruption, and if indeed as suggested by a number of empirical studies corruption hampers growth, then how did rich countries, who were poor once, become rich? Their answer to this puzzle was that one or two centuries ago, illegally obtained capital remained and was invested in one's home country. Thus, there was no need to smuggle illegally obtained resources outside the economy, and the gains from corruption became part of the economy's productive capital. In contrast, today it is harder for public officials, even in third world countries, to hide the profits of their illegal activities within their own country, and therefore, a larger proportion of stolen money is smuggled abroad. Interestingly, more recently Neeman *et al.* (2008) argued that in open economies, corruption and GNP per capita are strongly negatively correlated, but closed economies display no relationship at all. This fact is robust to a variety of different empirical specifications. They found that the degree of financial openness is primarily what determines whether corruption and output are correlated. Moreover, corruption is negatively related to capital accumulation in open economies, but not in closed economies.

countries to do the same. The cost of not doing so is lost contracts, as argued by Kantor<sup>23</sup>.

#### ***1.3.4.b. A country's endowments of natural resources.***

Natural resources endowments have also featured in cross-country studies of corruption; the explanation is that the concentration of exports on natural resources is a proxy for rent-seeking opportunities. Mauro (1996) argued that natural-resource endowments constitute a classic example of sources of rents, since they can typically be sold at a price that far exceeds their cost of extraction. Sachs and Warner (1995) argued that natural resource abundance creates opportunities for rent-seeking behavior and that it is an important factor in determining a country's level of corruption (see also Leite and Weidmann, 1999). Additionally, in countries with large endowments of valuable raw materials (such as fuels, minerals, and metals) corruption may offer greater potential gains to officials who distribute the rights to exploit these natural resources. In a simple growth model, Ades and Di Tella (1999) illustrate the interrelationship between natural resources, corruption, and economic growth, showing that the extent of corruption depends on natural resource abundance, government policies, and the concentration of bureaucratic power. Finally, also Treisman (2000) found empirical evidence that a higher concentration of natural resource exports increases perceived corruption.

#### ***1.3.4.c. The size of the public sector.***

A number of possible causes of corruption are related to the extent of government intervention in the economy, and more generally, to variables (such as, for example, the level of import tariffs, subsidies, or civil service wages) that are determined by government policy. When pervasive regulations exist and government officials have an excessive degree of discretion in applying them, and when regulations lack simplicity and transparency, private parties may be willing to pay bribes to government officials in order to obtain any rents that the regulations may generate (Mauro, 1996). Actually, a strong suspect is that many regulations, whatever their original rationale might have been, are kept in place with the sole propose of allowing bribes to be collected.

Tanzi (1998) summarized the following sources of corruption (due to government policy) that have been identified in the literature:

- The original rent-seeking literature emphasized trade restrictions as the prime example of government-induced sources of rents. As largely discussed in the previous *Paragraph 2.3.4.a.*

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<sup>23</sup> American policymakers have argued that American exporters have lost out in foreign deals because they have not pay bribes to foreign officials. For American companies the payment of bribes to foreign officials is a criminal act and the bribes paid cannot be deducted as costs for tax purposes. See, for example, the remarks by (then) Secretary of Commerce, Michael Kantor, to the Detroit Economic Club (July 25, 1996) in which he stated that since 1994 American companies had lost international contracts worth \$45 billion because of bribes paid by foreign contractors to the officials of foreign countries (see Hines, 1995; all cited in Tanzi, 1998). However, in nowadays, things are changing due to the OECD Anti-Bribery Convention established in 1997, see *notes 62-63.*

- Government subsidies (including tax expenditures) can constitute sources of rents, as argued by Clements *et al.* (1995). Ades and Di Tella (1997b) explained corruption as a function of industrial policy, showing that subsidies to manufacturing as a proportion of GDP are related to corruption indices.
- Because of the discretion that some high level public officials have over decisions regarding public expenditure, these can become much distorted, both in size and in composition, by corruption<sup>24</sup>.
- Price controls are also a potential source of rents, and therefore of rent-seeking behavior. For example, entrepreneurs may be willing to bribe government officials to maintain the provision of inputs at below-market prices<sup>25</sup>.
- Similarly, multiple exchange rate practices and foreign exchange allocation schemes lead to rents. For example, supposing that, in a given country, state-owned commercial banks conduct rationing of foreign exchange by allocating it according to the priorities established by each bank manager, then entrepreneurs may be willing to pay bribes in order to obtain the necessary foreign exchange to purchase their imported inputs.
- Low wages in the civil service relative to private sector wages or per capita GDP can be seen as a potential source of (low-level) corruption, following efficiency-wage mechanisms (Kraay and Van Rijckeghem, 1995; Haque and Sahay, 1996). When civil service pay is too low, civil servants may be grateful to use their positions to collect bribes as a way of “making ends meet”, and in any case their expected cost of being caught is correspondingly low (Mauro, 1996). Also Tanzi (1998: 16-18) and Van Rijckeghem and Weder (2001) found that low wages for civil servants have a statistically significant effect on corruption, demonstrating that if the wages that public officials receive are relatively low, the mechanism of corruption is reinforced.<sup>26</sup>

Another important factor that appears closely linked with corruption and the size of the public sector is privatization. There is no question that public or state enterprises have been a main source of corruption and especially of political corruption. In fact, they have been used to finance the activities of political parties and to provide jobs to clienteles of particular political groups<sup>27</sup>. Privatization of non-natural monopolies is a necessary step to reduce this form of corruption because it eliminates an instrument often used especially in political corruption (Tanzi, 1998). Unfortunately, the process of privatizing public or state enterprises has itself created situations

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<sup>24</sup> See Tazi and Davoodi (1997). The effects of corruption on public investments and expenditures in general will be largely analyzed in *Paragraph 3.2.2.c*.

<sup>25</sup> For a detailed analysis of this argument see also Tanzi (1998: 13-15).

<sup>26</sup> It may be useful to take such considerations into account when faced with difficult tradeoffs on whether an excessive civil service wage bill should be lowered through cutting salaries. *Fiscal Affairs Department* (1995: 15), warns of the dangers involved in lowering civil service wages (cited in Mauro, 1996).

<sup>27</sup> This was clearly the case in Italy, before tangentopoli, and in many Latin America countries. The Italian case was largely discussed by Nordio (1997; cited in Tanzi, 1998). Carlo Nordio was one of the leading judges in the Italian fight against political corruption.

where some individuals (ministers and high political officials) have the discretion to make the basic decisions while others (managers and other insiders) have information not available to outsiders so that they can use the process to benefit themselves. These problems have been observed and reported in all regions of the world, but the abuses appear to have been particularly significant in the transition economies<sup>28</sup>.

The previous arguments support the hypothesis that the size of the public sector can play an extremely important role in influencing corruption across countries. Corruption is, in fact, generally connected with the activities of the state and especially with the monopoly and discretionary power of the state. Consequently, as Gary Becker, Nobel Laureate in economics, pointed out in one of his *Business Week* columns, if we abolish the state, we abolish corruption<sup>29</sup>. But, of course, a civilized society cannot function without a state and in modern, advanced societies, the state must have many functions. Additionally, the Becker argument collides with the reality that some of the least corrupt countries in the world, such as Canada, Denmark, Finland, the Netherlands, and Sweden, have some of the largest public sectors<sup>30</sup>. Thus, the solution to the problem of corruption may not be as simple as just reducing the size of the state. Rather, the way the state operates and carries out its functions is far more important than the size of public sector activity. As seen above, particular aspects of governmental activities, such as regulation and authorizations, taxation, spending decisions, and the provision for goods and services at below market prices, create a fertile ground for corruption<sup>31</sup>. Identification of such policy-induced sources of corruption is obviously helpful in bringing it under control. According to Tanzi (1998) the role of the state in influencing corruption is so important that, in many cases, the fight against corruption cannot proceed independently from the reform of the state. *In many ways, it is the same fight*. Thus corruption will be reduced only in those countries where governments are ready to substantially reduce some of their functions.

The above review of the different causes determining corruption, especially political and economic causes, will be very useful to better understand, in the last section, why the phenomenon is affecting different countries in different ways. Additionally, we have discussed the causes because sometimes it is not easy to understand the direction of causality, for example: “Are close countries more corrupted, or is corruption discouraging openness?”. This question shows how it could be difficult to identify the correct direction of causality, and then to distinguish between causes and consequence of corruption.

The next section will largely analyze the different economic consequences of corruption, underlying especially the negative consequences (such as: reduced domestic and foreign investment, distorted government expenditures, overblown and less productive public investment, and so on) which have been seen by the scholars as the major channels through which corruption affects economic growth. This is the main reason which leads us to present, in *Paragraph 3.2.1*, a short summary of economic growth theories, to better understand which are the variables on which economic growth depends

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<sup>28</sup>For an overview of privatization and corruption in transition economies see Kaufmann and Siegelbaum (1996); for Russian privatization see Goldman (1997) and for a review of Latin American experience, see Manzetti and Blake (1997).

<sup>29</sup>Cited in Tanzi (1998).

<sup>30</sup>See *Table 5* in *Appendix* for the Corruption Perceptions Index of these countries.

<sup>31</sup>For a more detailed analysis of these issues see Mauro (1996: 5-7) and Tanzi (1998: 10-15).

and to understand how these variables are affected by corruption.

## 2. Corruption and Economic Growth

Although there exist several studies assessing the relationship between corruption and economic growth, their findings, however, are not universal and sometimes they are contradictory. A pioneering school of thought made up of proponents like Leff (1964), Huntington (1968) and Lui (1985), share the opinion that corruption is a beneficial grease that lubricates the engine of economic growth. On the contrary, a second school of thought argues that corruption exerts adverse effects on long-term economic growth and sustainable development. A host of scholars and international organizations constitute the proponents of this view. Among others: Mauro (1995, 1996, 2002); Akkihal *et al.* (1997); Porta and Vannucci (1997); Tanzi and Davoodi (1997); UNDP (1997); Wei (1997, 2000); World Bank (2000); Mo (2001); Gupta *et al.* (2001, 2002); Pellegrini and Gerlagh (2004); Blackburn *et al.* (2006, 2008), Dreher *et al.* (2007), Baliamoune and Ndikumana (2008), Aidt (2009). These authors hold the opinion that corruption has a corrosive effect on economic growth. The transmission mechanism of these adverse effects includes reduced investment; distorted government expenditure away from health and education; excessive military spending and excessive infrastructure and capital intensive investment; lower productivity of public investment; reduced effectiveness of foreign aid flows, and decreased flows of FDI. Overwhelming statistical evidence supporting this view exists in numerous recent studies.

In this section, we will first examine the theories in support for the hypothesis that corruption is beneficial for economic output, showing that, however, they rely on weak arguments which have been largely contradicted. In fact, the most recent empirical studies indicate that the effects of corruption are negative and pervasive throughout the economy, and that corruption might be seen as a “major obstacle” for economic growth rather than as a “beneficial grease”.

### 2.1 Corruption as a “beneficial grease” for economic growth

Some authors suggested that corruption might be desirable. According to this point of view, corruption works like piece-rate pay for bureaucrats, which induces a more efficient provision of government services, and which provides flexibility for entrepreneurs to avoid inefficient regulations. From this perspective, corruption acts as a lubricant that smoothes operations and, hence, raises the efficiency of an economy. The arguments in favor of this view are summarized below<sup>32</sup>.

Leff (1964) and Huntington (1968), for example, advanced the view that corruption can be efficiency-enhancing because it removes government-imposed rigidities which impede investment and interfere with other economic decisions favorable to growth. Thus, corruption “oils the mechanism” or “greases the process”. More recently, also Acemoglu and Verdier (1998) have

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<sup>32</sup> The discussion in this section is based on Jain (2001). For alternative surveys of the literature, see Bardhan (1997), Rose-Ackerman (1999), Aidt (2003) and Svensson (2005).

argued that some degree of corruption may be part of the optimal allocation of resources in the presence of incomplete contracts or due to market failure. This opinion is partly justified on the ground that illegal payments are required to make things pass faster and favorably through the state bureaucracy (Amundsen, 2000). By implication, corruption has the potency of making an economic agent more efficient and, in the long run, it promotes economic growth. These arguments have often been used to explain the high rates of growth in some East Asian countries, which are characterized by high levels of corruption. Given the importance of this anomaly, the paradox (better known as the *East Asian paradox*) will be amply discussed in *Section 4*.

In the same school of thought, Beck and Maker (1986) and Lien (1986) have developed models that show that in bidding competitions, those who are most efficient can afford to offer the highest bribe. Consequently, bribes can promote efficiency by assigning projects to the most efficient firms.

Lui (1985), instead, has argued that time has different values for different individuals, depending on their level of income and the opportunity cost of their time. Those for whom time is most valuable will offer bribes to public officials to be allowed to economize on time by jumping in front of the line, that is by getting decisions more quickly. Thus, corruption can be efficient because it saves time for those for whom time has the greatest value. However, later Lui (1996) has argued that while corruption may improve the allocation of resources in some circumstances, it reduces growth because it provides some individuals the incentive to acquire the kind of human capital that can be used to improve corruption opportunities. This argument is related to those by Baumol (1990) and by Murphy *et al.* (1991), discussed later in this paragraph.

Corruption has also been perceived as a useful political glue as it allows politicians to get funds that can be used to hold a country together. The latter outcome is seen as a necessary condition for growth (see e.g., Graziano, 1979).

According to same authors, additionally, bribes can supplement low wages. Then, corruption can allow the government to maintain a lower tax burden which can favor growth (see e.g., Tullock, 1996 and Becker and Stigler, 1974). The issue here is whether a lower tax burden is more favorable to growth than a lower degree of corruption.

However, the pro-corruption theoretical arguments discussed above can be contradicted in many ways, as largely discussed by Kaufmann (1997) and Tanzi (1998). The former argument is countered by the fact that rigidities and rules are not exogenous and unmovable features of a society, but they are created, and they may be intentionally created by public officials to extract bribes. When rules can be used to extract bribes, more rules will be created. Additionally, these rules are often kept intentionally unclear, so that more power will remain on the side of those who implement them.

Furthermore, in disagreement with the second argument, those who can pay the highest bribes are not necessarily the most economically efficient but the most successful at rent seeking. If bribes are

seen as investments, those who pay them must figure that they are investments with a high rate of return. Baumol (1990) and Murphy *et al.* (1991) have advanced related arguments that can be used to argue that in traditional or corrupt societies, the most able individuals will be diverted, by existing incentives, from pursuing socially productive activities towards rent seeking activities. This diversion will impose a high cost for the growth of these countries. If the potentially most socially productive individuals are in scarce supply, as they are assumed to be, the diversion of their talent toward rent-seeking activities and corruption will be particularly damaging to society.

Payment of speed money may be an inducement for the bureaucrats to reduce the speed at which most practices are being processed (see e.g., Myrdal, 1968). Bribes, in fact, may change the order in which public officials process the practices, but they may slow down the average time for the whole process.

Moreover, corruption and rent-seeking as political glue or as wage supplement may be helpful in the short run, but they may lead to major problems over the longer run as shown by Zaire under Mobutu (see Bratton and Van de Walle, 1994).

Consequently, we can argue that the theories according to which corruption can be seen as a “beneficial grease” rely on weak arguments and, as shown above, Kaufmann (1997) and Tanzi (1998) have offered a comprehensive list of practical and theoretical limitations of this view. Moreover, as we will mainly discuss below, the recent empirical literature suggests that less optimistic growth scenarios are plausible for countries affected by persistent corruption. Before than review this literature, however, we will briefly summarize the economic growth theories, to better understand which are the variables on which economic growth depends, and to understand, in the remaining part of the section, how corruption is affecting these variables. So, the questions which we will answer here are, respectively: 1) Which variables are influencing the economic growth? 2) Does corruption affect these variables, and, if yes, in which way? Obviously, to answer these questions we will refer to the relevant theoretical and empirical literature. In summary, according to the existing economic growth theories, the most important variables influencing the economic growth are: investment, human capital, foreign direct investment (FDI), and foreign aid<sup>33</sup>. There is a large body of theoretical and empirical literature which prove that the phenomenon of corruption is directly affecting these variables, or indirectly by influencing the governments who are called to decide about them.

## **2.2 Corruption as a “major obstacle” for economic growth**

### **2.2.1. Corruption and Economic Growth Theory**

Why are some countries rich and others poor? Why do some economies grow quickly, while others grow slowly or not at all? Why do some African countries remain mired in deep in poverty, with

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<sup>33</sup> Actually, the effects of foreign aid on economic growth have been studied by the economic growth scholars only recently, as we will discuss in some detail in *Paragraph 3.2.2.d.*

few signs of sustained growth and development? What determines the rate of growth of an economy and its aggregate level of output? These are some of the main questions in the study of economic growth. The most important exogenous (Solow, 1956; Cass, 1965; Koopmans, 1965) and endogenous theories of economic growth (Romer, 1986; Lucas, 1988; Barro, 1990; Rebelo, 1991), try to explain the processes by which economies grow and develop. Most models of economic growth focus primarily on the basic factors of production: the labor force and the capital stock. The simplest production function used in basic models of economic growth assumes that capital and labor always are utilized in a fixed proportion to produce different levels of output. This fixed-coefficient, constant returns to scale production function is the focus of a well-known early model of economic growth that was developed independently during the 1940s by economists Harrod and Domar (Harrod, 1939; Domar, 1946, 1947). The Harrod- Domar condition states simply that the rate of growth of national income will be directly or positively related to national saving ratio and inversely related to the national capital-output ratio. The economic logic of H-D equation is very simple: in order to grow, economies must save and invest a certain proportion of their GDP. The more they can save and invest, the faster they can grow. However, the empirical evidence strongly confirms the weakness of the H-D model. Domar himself argued that his model was not appropriate for determining long-term growth rates, and supported instead the Solow neoclassical growth model which predicted growth rates were dependent, not on investment, but on the rate of technological change (Easterly, 1998). The Solow neoclassical growth model (Solow, 1956) represented the seminal contribution to the neoclassical theory of growth. It expanded on the Harrod-Domar formulation by adding a second factor, labor, and introducing a third independent variable, technology, to the growth equation. Unlike the fixed-coefficient, constant-returns-to scale assumption of the Harrod-Domar model, Solow's neoclassical model exhibited diminishing returns to labor and capital separately and constant returns to both factors jointly. Technological progress became the residual factor explaining long-term growth, and its level was assumed to be determined exogenously, independently of all other factors.

A key implication of the Solow growth model is that, if all countries have the same potential level of income, poor countries will grow faster than rich countries and eventually will catch up at the steady state. In other words, we should observe the levels of income of countries around the world "converging" toward one another over time. Has this actually happened? The short answer is no. Since the 1950s, the opposite empirical result has been observed on average. In fact, only few poor countries have grown quickly, but others have recorded very low (even negative) rates of growth<sup>34</sup>. The only part that seems accurate is that almost all the rich countries display relatively slow growth rates, as expected (Perkins *et al.*, 2001)<sup>35</sup>.

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<sup>34</sup> Previous statistics, however, not really do justice to the Solow model. In fact, while there is no evidence for "absolute convergence" of income levels among all countries, there is a large body of evidence for "conditional convergence" of incomes once we control for differences in steady-state income levels (Baumol, 1986; Sachs and Warner, 1995).

<sup>35</sup> According to the *World Development Indicators 2008*, "average growth of low- and lower middle-income economies has been rising, surpassing that of upper middle-income and high-income economies in the last three decades. Since 2000 annual GDP growth in low-income economies has averaged 6.5 percent, compared with 5.6 percent in middle-income economies and 2.3 percent in high-income economies. Nevertheless, only a few large countries drive these averages: China, India, and the Russian Federation, which have performed exceptionally well and carry large weights in the aggregates. Growth remains uneven across regions and economies. Poverty traps, exclusion from global markets, internal conflicts, resource constraints, poor policies, and market failures and corruption have limited growth and poverty reduction in low-income economies, especially in Africa and Latin America" (*World Development Indicators 2008*: 194).

The studies that could find not convergence of per capita incomes in the world economy have been the major inspiration behind the development of the “new” or “endogenous” growth theories, since the mid-1980s. In fact, as we have seen above, contrary to the prediction of neoclassical growth theory based on the assumption of diminishing returns to capital, which, given identical preferences and technology across countries, should lead to faster growth in poor countries than in rich ones, the empirical evidence could not find convergence. So, endogenous Growth Models were developed as a response to the criticisms of the neoclassical growth model and to offer better explanation of the process of long-run economic growth. In these new models of endogenous growth there are assumed to be positive externalities associated with human capital formation (i.e., education) and research and development that prevent the marginal product of capital from falling and the capital-output ratio from rising. The theory views innovation brought about by investment in knowledge generation as the driving force of long term economic growth (Romer, 1986). More importantly, variants of endogenous growth models including Lucas (1988), Barro (1990), AK models like Rebelo (1991) and others, have demonstrated that policy variables can have significant impact on long-run economic growth. Furthermore, unlike the Solow model, new growth theory models explain technological changes as an endogenous outcome of public and private investments in human capital and knowledge-intensive industries. Thus, in contrast to the neoclassical theories, models of endogenous growth suggest an active role for public policy in promoting economic development through direct and indirect investments in human capital formation and the encouragement of foreign private investment in knowledge-intensive industries (Todaro and Smith, 2008: 149).

A large number of empirical studies, which have been inspired by “new” growth theories, observe the robustness of different variables in the determination of the growth rate. Thirlwall (2003: 177-181) has surveyed six pioneer studies: Barro (1991), Mankiw *et al.* (1992), Levine and Renelt (1992), Levine and Zervos (1993), Barro and Wha Lee (1993), Knight *et al.* (1993). Among a group of eight variables (saving-investment ratio, population growth, education, government consumption, political instability, monetary and fiscal variables, trade variables and inflation), only four seem to be robust in the sense that they remain statistically significant regardless of what other variables are included in the equation. These robust variables found in the majority of studies are the ratio of savings and investment to GDP, population growth, the initial level of per capita income, and investment in human capital measured by the secondary school enrollment rate. All other variables are not significant.

It’s clear, at this point, how corruption can affect economic growth and development. In fact, if, as seen above, public policy has a fundamental and active role in promoting development through direct and indirect investments in human capital formation and the encouragement of foreign private investment in knowledge-intensive industries, and, if the public policies are affected by corruption, there will never be satisfactory economic growth and development. The overwhelming statistical evidence demonstrates that countries with high corruption levels have poorer economic

performance. Though corruption was not given an explicit recognition in the traditional economic growth theories, it has now become a globally recognized policy variable especially in less developed countries where it is considered more critical for the attainment of long-term economic growth and sustainable development. Over the years, several studies have shown that corruption hinders economic growth. The World Bank (2000) identified corruption as “*the single greatest obstacle to economic growth and social development in the third world countries*”, as it distorts the rule of law and weakens the institutional foundations from which economic growth depends.

In fact, though corruption is present in almost any country, it has the most devastating effects in developing economies, because it hinders any advance in economic growth. There are different channels through which it might happen. In fact, it has been found that corruption: (i) reduces investment; (ii) distorts government expenditure away from health and education; (iii) increases public investment, encouraging excessive infrastructure and capital intensive investment, and reduces its productivity; (iv) decreases the flood of inward foreign direct investment (FDI); and (v) diminishes the effectiveness of foreign aid flows. Moreover, it has been largely recognized that corruption also increases inequality and poverty. All these channels/impacts will be mostly analyzed in the following part of this section.

### **2.2.2. Review of related theoretical and empirical literature**

The aim of this paragraph is to summarize the most influencing existing literature regarding the channels through which corruption affects economic growth.

#### ***2.2.2.a. The Effects of Corruption on Investment***

In the presence of corruption, entrepreneurs know that a portion of the profits from their investments may be claimed by corrupt officials. To obtain the issue of necessary permits and authorizations, in fact, payment of bribes is often required. Consequently, corruption may be interpreted to act as a tax, though of a particularly damaging nature, given the need for secrecy and the uncertainty that come with it, which correspondingly reduces incentives to invest (Mauro, 1995).

The first econometric investigation on the impact of corruption on investment in a cross-section of countries was undertaken by Mauro (1995), who engaged in an empirical analysis of the impact of corruption on economic growth and investment across countries<sup>36</sup>. Mauro’s objective was “...to identify channels through which corruption affects economic growth and to quantify the magnitude of these effects” (1995: 682). His results indicated that corruption significantly lowers the levels of investments in an economy, even when allowance is made for the level of bureaucracy within the country<sup>37</sup>. Such reduction in investment is assumed to be caused by the higher costs and by the

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<sup>36</sup> Using Barro’s (1991) framework, Mauro (1995) pioneered the econometric investigation of the impact of corruption on economic growth and investment across countries. Using Business International (BI) data for 70 countries for the period 1980-83, he found a significant negative relationship between corruption and the average annual economic growth rate over the 1960-85 period, and between corruption and the investment-GDP ratio and other kinds of investments for 1960-85 and for 1980-85 as well.

<sup>37</sup> Keefer and Knack (1995) obtain broadly similar results and, in their estimates, institutional variables have a significant direct effect on growth in addition to the indirect effect through investment.

uncertainty that corruption creates. In Mauro's analysis, the reduction in the rate of growth is a direct consequence of the decline in the investment rate. In other words, his analysis is based on a production function that makes growth a function of investment.

### ***2.2.2.b. The Effects of Corruption on Government Expenditure***

Mauro (1996) extended its pioneering study to a larger sample of countries and examined, in addition to the links between corruption and investments, the effects of corruption in the size and composition of government expenditure. The results of this extended study confirmed Mauro's earlier results that corruption significantly affects economic growth and investments in the economy. Moreover, he found that corruption reduces expenditures on health and education, while encourages excessive infrastructure and capital intensive investment. This is because the opportunities to extract rents from public expenditures on health and education are relatively less compared to other sectors.

Corrupt government officials, in fact, may be more likely to choose to undertake types of government expenditure that consent them to collect bribes and to maintain them secret. Sleifer and Vishny (1993) suggested that large projects and specialized items, whose exact value is difficult to monitor, lead to more lucrative opportunities for corruption. Then, one might expect that it is easier to collect considerable bribes on huge infrastructure projects or high-technology defense equipment than on textbooks and teacher's salaries. Hines (1995), for example, argued that international trade in military aircraft is particularly susceptible to corruption. Furthermore, Gupta *et al.* (2001) have shown that corruption is associated with higher military spending as a share of GDP and total government expenditures, and with larger procurement expenditures in relation to both GDP and government spending. They concluded that, although some caution is needed, due to the data limitations, the evidence reported in their paper is indicative that countries perceived as being more corrupt tend to spend more on the military<sup>38</sup>.

In other sectors, such as health, the picture is less clear-cut: opportunities to collect bribes may be abundant in the case of hospital buildings and state-of-the-art medical equipment, but may be more limited in the case of doctors' and nurses' salaries<sup>39</sup>.

Similarly, as we will see in the next paragraph, Tanzi and Davoodi (1997) found that corruption also reduces expenditure for operation and maintenance for the same reasons that reduce expenditure for education and health.

So, the argument here is that politicians choose to spend more on those components of public

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<sup>38</sup> Their results are fairly robust to different model specifications, estimations techniques, and data sources (the empirical analysis is based on data from four different sources for up to 120 countries during 1985-1998). The paper supported the possible use of military spending in relation to GDP and total government spending as an appropriate governance indicator (Gupta *et al.*, 2001).

<sup>39</sup> As noted also by Tanzi (1998: 29), the provision of health is often distorted by bribes to doctors or to other medical personnel to get better or faster services.

expenditure on which it is easier to levy bribes. And, in this way, corruption affects the composition of government expenditure. The question whether corruption affects the composition of government expenditure is an interesting one to consider because, even if the empirical literature has yielded mixed results on the effect of government expenditure and, in particular, its composition, on economic growth<sup>40</sup>, most economists seem to think that the level and type of spending undertaken by governments do matter for economic performance. For example, even if cross-country regression work has not conclusively shown a relationship between government spending on education and economic growth, it has been found quite robust evidence that school enrollment rates (Levine and Renelt, 1992) and educational attainment (Barro, 1992) play a considerable role in determining economic growth<sup>41</sup>.

### ***2.2.2.c. The Effects of Corruption on Public Investment***

In the same vein of Mauro (1996), Tanzi and Davoodi (1997) also examined the effect of corruption on the size and composition of public expenditure, with particular attention to public investment. More specifically, they argued that corruption, especially “grand corruption”, distorts the entire decision-making process connected with public investment projects. This will happen mainly when some of the essential controlling or auditing institutions are not well developed and institutional controls are weak. The evidence they presented showed that higher levels of corruption are associated with (i) higher public investment; (ii) lower government revenues; (iii) lower expenditures on operations and maintenance (O&M); and (iv) lower quality of public infrastructure. The evidence also showed that corruption increases public investment while reducing its productivity. Clearly, these are five channels through which corruption lowers growth.

As seen in *Paragraph 3.2.1.*, economists favor high capital spending because they believe that it contributes to growth. Harrod, Domar, and others, for example, argued that countries need capital to growth and, more importantly, that there is an almost mechanical relation (the so-called capital-output ratio) between increased capital spending and increased growth; however there has been a strong intellectual bias in the economic profession in favor of capital spending. For example, when economists evaluate the allocation of public money between current and capital spending in government budgets, they tend to be critical of countries that allow the share of current spending to grow. On the other hand, they generally praise countries where the share of capital spending in total government expenditure goes up. The above bias is protected in the “golden rule” that many economists advocate for countries. That rule essentially affirms that it is all right to borrow as long as the borrowing is for investment projects; this means that only current expenditure needs to be balanced by ordinary revenue, and that a country can have a fiscal deficit equal to the net capital

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<sup>40</sup> Concerning the overall level of government expenditure, Levine and Renelt (1992) showed that it does not seem to bear any robust relationship with economic growth. Easterly and Rebelo (1993), however, found some significant correlations: public investment on transport and communications is positively associated with economic growth, though not with private investment; public investment in agriculture is negatively associated with private investment; general government investment is positively correlated with both growth and private investment; and public enterprise investment is negatively correlated with private investment.

<sup>41</sup> Probably, part of the reason why it has proved difficult to find significant and robust effects of the composition of government expenditure on economic growth is that the quality of the available data may be relatively low.

spending of the government<sup>42</sup>. This rule continues to be invoked as a good guide to policy, even in the face of much evidence that some current spending, such as “operation and maintenance” that keeps the existing infrastructure in good conditions or spending that contributes to the accumulation of human capital, such as spending for education, can promote growth more than capital spending. Moreover, as suggested by Tanzi and Davoodi (1997: 21), “economists should be more restrained in their praise of high public sector investment spending and of rules such as “golden rule”, especially in countries where corruption, and especially high level corruption, is a problem”.

Politicians have internalized and “exploited” the above pro-investment bias and have pushed for larger investment budgets. However, larger expenditure for highly visible investment projects such as roads, airports, power plants, and ports may come at the cost of smaller expenditures for less visible and less politically attractive expenditure on operations and maintenance (O& M). Additionally, public investment projects lend easily to manipulations by high levels officials to get bribes. In effect, there is nothing routine about the investment budget and its composition. While much current government spending reflects particularly explicit or implicit entitlements or previous commitments (e.g. pensions, interest payments on the debt, salaries, subsidies, and so on), thus allowing restricted discretion in the short run to politicians, capital spending, instead, is highly discretionary. As seen in *Section 2*, when politicians have high discretionary power, then there is large room for corruption, and this is the case especially for public investment projects. Most of the times, in fact, public investment projects tend to be large and in some cases they are very large<sup>43</sup>. Their execution is often contracted out to domestic or foreign private enterprises. There is thus a need to choose the enterprise that will be responsible for undertaking the project. The process of approval of an investment project involves several phases, and in some of these phases, it will be possible for a strategically-placed high-level official to influence the process in ways that lead to the selection of a particular enterprise. Clearly, for a private enterprise, getting a contract to complete a project, and especially a large one, can be extremely lucrative. Consequently, the managers of these enterprises may be willing to pay a “commission”<sup>44</sup> to the government officials that help them win the contract<sup>45</sup>.

According to Tanzi and Davoodi (1997), the enterprise that pays the “commission” will not suffer from the payment of the bribe if it is able to recuperate the cost. This could be made in several ways: (i) through up-front cost recovery if it can win the bidding competition with an offer that includes the cost of the commission; (ii) the enterprise can have an understanding with the influential official that the initial low offer can be adjusted upward along the way; or (iii) reduce its projects costs by saving on the quality of the work done and on the materials used. In all these

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<sup>42</sup> Essentially, this means that it is all right to borrow to finance the building of new roads but not to finance the repairs of existing roads; or to borrow for the building of a new hospital, but not for the hiring of doctors or nurses or for buying medicines.

<sup>43</sup> Here we mainly refer to infrastructure investments. It has been known for some time that corruption is most prevalent in infrastructure sector ( see e.g., Wade, 1982 Rose-Ackerman, 1996).

<sup>44</sup> “Commission” is a euphemism for what is essentially a bribe.

<sup>45</sup> In some countries, commissions paid by their enterprises to foreign politicians are both legal and tax deductible. Such “commissions” are often calculated as percentages of the total cost of the projects (see *Footnotes 61-62*). Interestingly, in many cases the act of bribery may not start with the enterprises but with the officials who control the decisions. Foreign enterprises reported that in some countries it is impossible to get a government contract without paying a bribe (Tanzi and Davoodi, 1997: 6).

alternatives, which require the cooperation of the corrupt official, the country will end up with either: a bigger or more complex project than would have been necessary, with a higher cost for the specified project than would have been the case in absence of corruption, or with a project of inferior quality that will require costly repairs<sup>46</sup>. This means that corruption lowers the quality of public infrastructure. More specifically, according to Tanzi and Davoodi (1997), when “commissions” paid out by enterprises to public officials to win an investment contract are attached to the projects’ costs, an incentive may be created for larger projects. The net results are: first an increase in the share of public investment in the total budget<sup>47</sup>; second a fall in the average productivity of public investment; and finally a possible reduction in some other categories of public spending, such as O&M expenditures and expenditures on education and health. Reductions in O&M expenditures result in deteriorating the quality of the infrastructure, and then its productivity. Moreover, the authors argued that corruption can reduce government revenue if it contributes to tax evasion, improper tax exemptions or weak tax administration. Therefore, because corruption reduces public revenue and increases public spending, it contributes to larger fiscal deficits, making it more difficult for the government to run a sound fiscal policy (Mauro, 1996).

It is important to emphasize that the arguments discussed above identify some of the channels through which corruption, affecting public investment, reduces economic growth. First, corruption can reduce growth by increasing public investment while reducing its productivity. This finding is consistent with typical reduced-form cross-country growth regressions. For example, Devarajan *et al.* (1993) have found that higher public investment is associated with lower growth, and Tanzi (1994) found that the relationship between growth and investment is highly sensitive in a couple of countries. Second, corruption can reduce growth by reducing the quality of the existing infrastructure. A deteriorating infrastructure increases the cost of doing business for both government and private sector (e.g., congestion, delays, break-down of machineries, etc) and thus leads to lower output and growth. The importance of infrastructure in growth has been shown in many cross-country regressions (Canning and Fay, 1993; Easterly and Levine, 1997; Hulten, 1996). Finally, as we said, corruption can reduce growth by lowering government revenue needed to finance productive spending, such as education.

#### ***2.2.2.d. The Effects of Corruption on Foreign Aid***

Using the neoclassical production function, some authors (e.g. Bosworth and Collins, 2003) have argued that higher aid could be assumed to raise physical capital one-for-one, and then also raise the percent of GDP growth. However, despite the simple implications of the neoclassical model, early studies<sup>48</sup> failed to agree on the observed effect of aid on output growth. Although several later studies<sup>49</sup> found a positive growth impact when aid interacts with other growth determinants.

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<sup>46</sup> The experience with public sector projects, especially in developing countries, is full of stories about roads that needed to be repaired a short time after completion, power plants that worked at much lower capacity than anticipated, and so on (Tanzi and Davoodi, 1997: 8).

<sup>47</sup> See also Mauro (1996).

<sup>48</sup> For example: Griffin and Enos (1970); Papanek (1973); Dowling and Hiemenz (1982); Gupta and Islam (1983); Boone (1994) all cited in Farah *et al.* (2009).

<sup>49</sup> For example: Burnside and Dollar (2000); Chauvet and Guillaumont (2002).

Roodman (2003) and Easterly *et al.* (2003) demonstrated that the significance of this relationship is not robust. Rajan and Subramanian (2005) found that aid has negative effects on economic growth because of the adverse effects of aid-induced appreciation of the real exchange rate on exports, though the methodology used to obtain these conclusions has been contested<sup>50</sup>.

Recent studies that look at more disaggregated aid data seem to discover a positive relationship between aid and growth. Clemens *et al.* (2004) found that aid allocated to physical investment (e.g., infrastructure and program assistance) has a visible impact on growth while that allocated to human capital (e.g., health and education) has a long term growth payoff that is econometrically harder to identify. Minoiu and Reddy (2007) discriminated *geopolitical aid* (e.g., general budgetary support, roads for military bases) from *development aid* (e.g., irrigation, infrastructure, health, and education). They found that a 1 percent of GDP increase in development aid increases average growth by about 0.5 percentage points over the following 10 years and between 0.6 and 2.1 percentage points after 25 years; but they also found that geopolitical aid has either a zero or a negative growth impact, depending on the specification. Also Heady (2005, 2007) and Bobba and Powell (2007) found a positive impact of non-geopolitical aid.

More recently, Agénor *et al.* (2005) developed a model that captures the links between foreign aid, the level and composition of public investment, and their effects on economic growth and poverty. Farah *et al.* (2009) developed a simple macroeconomic model that assesses the effects of higher foreign aid on output growth and other macroeconomic variables. The model takes into account the impact of aid on physical and human capital accumulation, while recognizing that the impact of the latter is more extended. The authors applied the model to Niger, founding that if foreign aid as a share of GDP were to be permanently increased from the equivalent of 10 percent in 2007 to 15 percent in 2008, annual economic growth would accelerate by more than 1 percentage point, without generating significant risks for macroeconomic stability. As a result, by 2020 Niger's income per capita would be 12.5 percent higher than it would be without increased foreign aid. Moreover, the higher growth would help the country to cut the incidence of poverty by 25 percent by 2015, although the country will still be incapable to achieve the Millennium Development Goals of poverty reduction.

So, we can assume that aid, especially development aid, has a positive impact on economic growth. Consequently, the possibility that corruption might reduce the effectiveness of aid flows, through the misallocation of funds, is of particular negative importance to developing countries. The vast literature on aid flows has addressed the question of whether the fungibility of aid resources may imply that aid eventually finance unproductive public expenditures. The critics of aid programs, in fact, argue that contrary to the more or less sincere intentions of the donors, corrupt governments following very poor policies receive just as much aid as less corrupt ones. Actually, according to the World Bank (1998), financial assistance does not often reach the really deprived in developing countries, but instead it is wasted in inefficient public consumption. Many critics make an even

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<sup>50</sup> Kraay (2006); Minoiu and Reddy (2007).

stronger argument, specifically that not only corrupt governments are not discriminated against in the flow of international assistance, but, in fact, foreign aid promotes corruption by increasing the size of resources contested by interests groups and factions. This point is made in Svensson (2000), and it is coherent with Tornell and Lane's (1999) theory.

Probably, as a result of this continuing debate, many donor countries have focused increasingly on issues of good governance, and in some cases where governance is considered to be very poor, some donors have scaled back their assistance (IMF, 1995: 32-34, cited in Mauro, 1996). Actually, Alesina and Weder (2002) found that there is no empirical evidence that more corrupt governments receive less foreign aid<sup>51</sup>. However, the authors found significant differences across donors. Scandinavian donors (the most generous in per capita terms, at that time) and Australia give more to less corrupt governments, while the United States appears to favor democracies over dictatorships, but seems to pay not attention to the quality of governments of receiving countries<sup>52</sup>. Also multilateral aid, namely aid from international organizations, does not discriminate against corruption of the receiving country.

Whatever is the effect of corruption on the capacity of a developing country to attract foreign aid, it remains that, if there is corruption, foreign aids are being used in a wrong way, so they lost their natural function of financial help to eradicate poverty and promote development.

#### ***2.2.2.e. The Effects of Corruption on Income Inequality and Poverty***

If there is corruption, government officials may use their authority for private gain in designing and implementing public policies (Tanzi, 1997). This phenomenon may result in enriching these officials as well as private individuals who obtain a larger share of public benefits or bear a lower share of public costs. In this way, corruption distorts the government's role in resource allocation. It has been argued (Tanzi, 1995) that the benefits from corruption are likely to flow to the better-connected individuals in the society, who belong mostly to high-income groups. Thus, corruption would affect not only broad macroeconomic variables, such as investment and growth, but also income distribution (we will return to this point in *Paragraph 4.3*). It has been further contended that corruption increases poverty by reducing the level of social services available to the poor, creating incentives for higher investment in capital-intensive projects and lower investment in labor-intensive projects. Such a bias in investment strategy deprives the poor of income-generating opportunities (Rose-Ackerman, 1997, 1999).

Empirical evidence of the considerable adverse effects of corruption on income inequality and poverty has been shown by Gupta *et al.* (2002)<sup>53</sup>. These authors carried out an elaborate empirical

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<sup>51</sup> The same result applies to debt relief program, and additional forms of aid.

<sup>52</sup> The reason why Scandinavian donors and Australia can better discriminate is that they did not have colonies and they are free from specific political pressures.

<sup>53</sup> The authors found that a worsening in the corruption index of a country by one standard deviation (2.52 points on a scale of 0 to 10) increases the Gini coefficient by 11 points which is significant, given the average Gini value of 39. A one-standard deviation increase in the growth rate of corruption (a deterioration of 0.78 percentage points) reduces income growth of the poor by 4.7 percentage points per year which is considerable given the average income growth of 0.6 percent a year.

study on the effects of corruption on inequality. They found that corruption tends to increase inequality and poverty through lower economic growth; biased tax systems favoring the rich and influential; lower social spending, unequal access to education and poor targeting of social programs; interest-group lobbying that perpetuates asset inequality; and increased risk for investment decisions of the poor.

High corruption can lead to high poverty for two reasons. First, evidence suggests that a higher growth rate is associated with a higher rate of poverty reduction (Ravallion and Chen, 1997), and that corruption slows the rate of poverty reduction by reducing growth<sup>54</sup>. Second, income inequality has been shown to be harmful to growth (Alesina and Rodrik, 1994; Persson and Tabellini, 1994), and if corruption increases income inequality, it will also reduce growth and thus limit poverty reduction (Ravallion, 1997)<sup>55</sup>.

Moreover, as discussed before, corruption can lead to tax evasion, poor tax administration, and exemptions that disproportionately favor the well-connected and wealthy population groups. This can reduce the tax base and the progressivity of the tax system, possibly leading to increased income inequality (Gupta *et al.*, 2002: 26). Additionally, for a given tax system, the higher the level of corruption, the lower the tax revenue and the lower the resources available for funding public provision of certain services, including education.

There are also other factors determining the influence of corruption on education. First, corruption increases the operating cost of government, and, therefore, reduces the resources available for other uses, including the financing of social spending that is crucial to the formation of human capital. Second, wealthy urban elites can lobby the government to bias social expenditure toward higher education and tertiary health, which tend to benefit high-income groups<sup>56</sup>. Finally, corruption can increase the share of recurrent expenditures devoted to wages as opposed to operations and maintenance (Tanzi and Davoodi, 1997). This lowers the quality of education and health services and affects the ability of the state to improve educational attainment levels.

Corruption can also affect the targeting of social program to the truly needy. The use of government-funded programs to extend benefits to relatively wealthy population groups, or the siphoning of funds from poverty-alleviation programs by well-connected individuals, will diminish the impact of social programs on income distribution and poverty (Rose-Ackerman, 1999).

#### ***2.2.2.f. The Effects of Corruption on Foreign Direct Investment (FDI)***

For a long time, foreign direct investment (FDI) has played an important role in international business and in the economic development. In fact, international direct investment is particularly important for developing countries, for which it is not only a source of scarce capital but also an

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<sup>54</sup> A number of studies have found a negative correlation between income growth and inequality, for example World Bank (2002), Dollar and Kraay (2002) and Dollar (2004).

<sup>55</sup> It is possible for income inequality to be high enough that it results in rising poverty, despite high growth (Ravallion, 1997).

<sup>56</sup> As seen above, corruption can also increase expenditure on tertiary health because bribes can be more easily extracted from the building of hospitals and purchasing of state-of-the-art medical equipment than from expenditure on, for example, vaccinations.

important channel for the transfer of technological and managerial know-how (Eaton and Tamura, 1995)<sup>57</sup>.

FDI represents one of the most studied yet not completely explained topics in international business literature<sup>58</sup>. There exist two views of corruption: one negative, according to which corruption reduces FDI because it increases costs and uncertainty, and another positive, according to which corruption increases FDI because it helps avoid the costs of operating in an environment characterized by poorly-developed regulations. These two views have been presented as opposing arguments. But, as largely discussed in the literature, one way to solve the apparent theoretical contradiction is to argue that they operate in different situations. We will return to this later.

Initially, the effects of corruption on foreign direct investment (FDI) have been empirically analyzed by Wei (1997) who examined bilateral FDI from 12 developed countries to 45 destination countries and found that corruption negatively impacts FDI, since it acts as a tax<sup>59</sup>. Additionally, Wei (1999) concluded that the less predictable the level of corruption (i.e., the higher is its variance), the greater is its impact on FDI, as higher variance makes corruption act like an unpredictable and random tax that increases risk and uncertainty. We will return to this later. Thus, increases in corruption and its arbitrariness are equivalent to increases in the tax rate on enterprises<sup>60</sup>. Similarly, Habib and Zurawicki (2002) empirically examined bilateral FDI flows from 7 developed countries to 89 countries and found that both the level of corruption in the host country and the difference in levels of corruption in the home and host countries have a negative impact on FDI. Furthermore, they found that the degree of international openness and the political stability of the host market moderate the influence of corruption. Lambsdorff (2003) studied investment in 54 countries and found that corruption has a negative impact on foreign investment. Voyer and Beamish's (2004) analysis of Japanese FDI found that corruption has a negative impact on FDI in developing nations. Besides reducing FDI, corruption induces firms to change the mode of entry and select joint ventures over wholly owned operations (Smarzynska and Wei, 2000; Uhlenbruck *et al.*, 2006). Cuervo-Cazurra (2006) argued that corruption results in relatively lower FDI from countries that have signed the *OECD Anti-Bribery Convention*<sup>61</sup>; this suggests that laws against bribery abroad may act as a deterrent against engaging in corruption in foreign countries. Furthermore, corruption results in relatively higher FDI from countries with high levels of corruption; this suggests that investors that have been exposed to bribery at home may not be deterred by corruption abroad and instead seek countries where corruption is widespread.

The above arguments have shown that numerous empirical studies demonstrate that corruption reduces investment. But, how robust is this relationship? Although corruption is rarely justified on

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<sup>57</sup> See also UNCTAD (2006: 31-32) about the gains from South- South FDI, pp.31-32,

<sup>58</sup> See for example reviews by Brewer (1993), Caves (1996), Ensign (1996).

<sup>59</sup> This has been noted also by Tanzi (1998).

<sup>60</sup> Wei (1998) demonstrated, for instance, that if India's corruption level were reduced to Singapore's, its effect on attracting foreign investment would be the same as reducing its marginal corporate tax rate by 22 percentage point.

<sup>61</sup> The *OECD Anti-Bribery Convention* establishes legally binding standards to criminalize bribery of foreign public officials in international business transactions and provides for a multitude of related measures that make this effective. This Convention has been adopted by the 30 OECD member countries and eight non-member countries: Argentina, Brazil, Bulgaria, Chile, Estonia, Israel, Slovenia and South Africa.

ethical foundations, some scholars (Lui, 1985; Leff, 1964) view corruption in positive terms as “grease in the wheels of commerce”. Corruption is seen as facilitating transactions and speeding up procedures that would otherwise not happen or happen with more difficulty (Huntington, 1968), as we have largely discussed in *Paragraph 3.1*. Though scarce, some empirical researches have not found a negative relationship between corruption and FDI. Wheeler and Mody (1992), for example, in a study of foreign investment of U.S. firms, failed to find a significant correlation between the size of FDI and the host country’s risk factor, a composite measure that includes perceptions of corruption as one of its components, but this may be an imperfect measure of corruption. Similarly, Hines (1995) found that corruption in the host country does not appear to affect the flood of FDI, with the exception of US investors. He interpreted this conclusion as a result of the U.S. *Foreign Corrupt Practices Act* of 1977<sup>62</sup>. Actually, according to Wei (2000), in spite of their *Foreign Corrupt Practices Act*, American investors are averse to corruption in host countries, but not necessarily more than average OECD investors. In effect, also Henisz (2000) found that corruption tends not to affect the investments of US multinational enterprises. Furthermore, Egger and Winner (2005) found a clear positive relationship between corruption and FDI, for a sample of 73 developed and less developed countries and for the time period 1995-1999, hazarding the conclusion that corruption is a stimulus for FDI.

More recently, Cuervo-Cazurra (2008) demonstrated that transition economies show high levels of corruption and also high levels of FDI. Then, he argued that it is not the level but rather the type of corruption that affects FDI in transition economies. Actually, the Cuervo-Cazurra’s (2008) empirical example of the anomaly is just the most recent, but not the only one in the literature. Before than him, and more significantly, different authors<sup>63</sup> have tried to explain the so-called “East Asian paradox”: the combination of high-corruption, high growth and high-inflow of FDI. The next section will better analyze this paradox, summarizing the plausible explanations of the phenomenon, and trying to understand if, in effect, this paradox is a serious challenge to the hypothesis that corruption reduces FDI and slows economic growth.

### **3. The East Asian Paradox**

#### **3.1. What the paradox consists? Some possible explanations**

Since now, we have seen that most of the theoretical and empirical studies have demonstrated that corruption reduces investment and slows economic growth, and that the pioneering theories in favor of corruption have been strongly contradicted. However, there remain a certain degree of ambivalence among scholars about the impact of corruption on economic growth and on FDI. This is in part due to the so-called “East Asian paradox”<sup>64</sup>: the achievement of very high growth rates in

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<sup>62</sup>The *Foreign Corrupt Practices Act* (FCPA) was enacted in 1977 and substantially revised in 1988. The provisions of the FCPA prohibit the bribery of foreign government officials by U.S. persons and prescribe accounting and record-keeping practices. The U.S. has stood alone for many years in its legislation against the bribery of foreign government officials. Paradoxically, in some other countries, “commissions” paid by their enterprises to foreign politicians were both legal and tax deductible, and such “commissions” were often calculated as percentages of the total cost of the projects. However, in early 1996, the International Chamber of Commerce (ICC) adopted new “*Rules of Conduct to Combat Extortion and Bribery*” and in so doing encouraged companies worldwide to adopt the conduct rules and incorporate them into their employee guidelines. Additionally, in December 1996, the General Assembly of the United Nations adopted a “*Declaration against Corruption and Bribery in International Commercial Transactions*”. Finally, in 1997, the Organization for Economic Cooperation and Development (OECD) established the *Anti-Bribery Convention*, discussed in note 62.

<sup>63</sup> For example, Wei (1997) and Campos *et al.* (1999).

<sup>64</sup> The term was introduced for the first time by Wedeman (2002: 34).

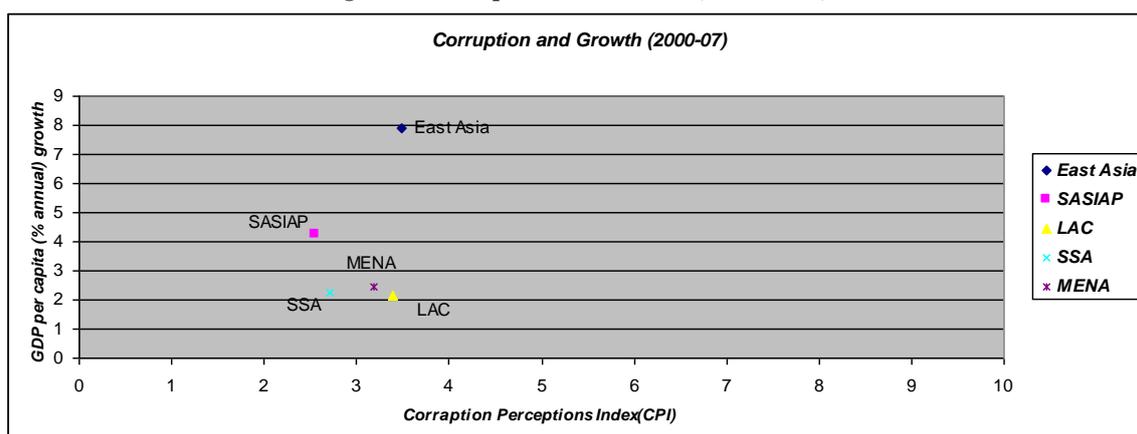
real per capita income over relatively long time periods and very high flows of FDI, in spite of rather high levels of corruption. The *Transparency International (2002-2008)* has ranked China, Viet Nam, Indonesia, and Thailand among the most corrupt countries<sup>65</sup> and yet, as *Table 1* shows, these countries have been growing and have continued to grow at very high rates, and to attract considerable flows of foreign capitals (See *Figure 1* for Corruption and Growth, and *Figure 2* for Corruption and FDI).

**Table 1. Growth rates and Corruption Perceptions Index (CPI 2002-07).**

	<i>Average corruption ratings 2002-07</i>	<i>Average GDP growth rate (%) 2000-07</i>
China	3,6	9,42 %
Viet Nam	2,7	6,37 %
Thailand	3,5	4,22 %
Indonesia	2,6	3,97 %
India	3,4	5,64 %
Egypt	2,8	2,74 %
Kenya	2,1	1,33 %
Brazil	3,5	2,02 %
Mexico	3,6	1,88 %
<b>Data Figure 1</b>		
<i>East Asia</i>	3,5	7,92 %
<i>South Asia and Philippines</i>	2,5	4,24 %
<i>Latin America &amp; Caribben</i>	3,4	2,17 %
<i>Sub-Sahara Africa</i>	2,7	2,23 %
<i>Middle East and North Africa</i>	3,1	2,44 %

Source: Corruption data are from Transparency International (CPI average 2002-2007). Data on per capita GDP growth (% annual) are from World Development Indicators 2009 (average 2000-2007). See note 67.

**Figure 1. Corruption and Growth (2000-2007).**



Source: Elaboration of the author. Corruption data are from Transparency International (CPI average 2002-2007), data on per capita GDP growth (% annual) are from World Development Indicators 2009 (average 2000-2007).

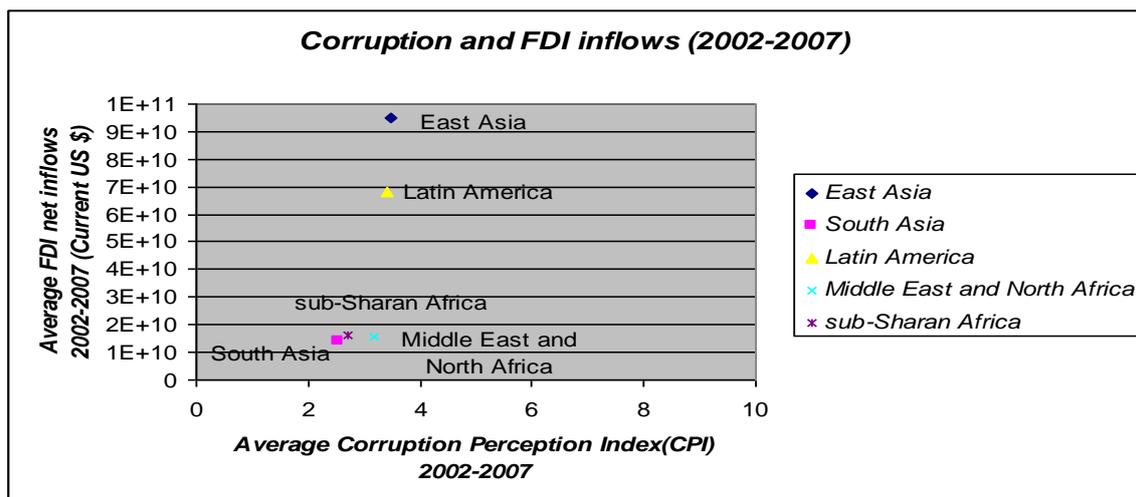
East Asia: China, Indonesia, Thailand, South Korea, Viet Nam; SASIAP: South Asia and Philippines; LAC: Latin America and Caribbean; SSA=sub-Saharan Africa; MENA= Middle East and North Africa<sup>66</sup>.

<sup>65</sup> For the 2008 corruption rating (CPI) see also *Table 5* in Appendix.

<sup>66</sup> Here and in the next tables and figures for *East Asia* we intend: China, Thailand, Indonesia, Viet Nam. For *Latin America and Caribbean*: Argentina; Belize; Bolivia; Brazil; Chile; Colombia; Costa Rica; Cuba; Dominica; Dominican Republic; Ecuador; El Salvador; Grenada; Guatemala; Guyana; Haiti; Honduras; Jamaica; Mexico; Nicaragua; Panama; Paraguay; Peru; St. Lucia; St. Vincent and the Grenadines; Suriname; Uruguay; Venezuela. For *Middle East and North Africa*: Algeria; Djibouti; Egypt, Arab Rep.;

This observation contrasts with the conventional thought that corruption impedes economic performance: it is inconsistent with the theory that weak institutions, of which corruption is a concrete manifestation, discourage investments and thus limit growth. Wei (1997) has attempted the first empirical analysis that more expressively addresses the *East Asian Paradox*. The author showed that, controlling for other factors such as per capita GDP, the impact of corruption on the flow of FDI is not different in East Asia relative to other countries. The implication is that in East Asia other factors “swamp” the negative effect that corruption has on FDI. This offers a possible explanation of why East Asian countries have grown more rapidly despite significantly high levels of corruption. In fact, other empirical studies of Wei (1999) found that ethnic connections lead to higher flows of FDI, and in particular that much of the FDI that flows into China comes from overseas Chinese<sup>67</sup>. This suggests that informal institutions may be an important omitted variable which affects the nature of corruption and thus its impact on investment. It supports the thesis that in East Asia, informal norms inseparably connected to illicit exchanges help enforce intertemporal transactions that facilitate relatively larger inflows of FDI.

Figure 2. Corruption and FDI inflows ( 2002-2007).



Source: Elaboration of the author. Corruption data are from Transparency International (CPI average 2002-2007), data on FDI net inflows (billions \$) are from World Development Indicators 2009 (average 2002-2007).

This view is consistent with the work of Shleifer and Vishny (1993) who analyzed different types of corruption regimes, namely: monopolistic vs. independent “suppliers” of bribe, an approach that is also evident in Kaufmann (1997). Usually, as we will see later, monopolistic regimes are more predictable than independent regimes. Following the same line, Campos *et al.* (1999), attempting to solve the *paradox*, argued that it is not only the level of corruption that affects economic growth and investment, but also the nature of corruption. Corruption regimes that are more *predictable*, in the sense that those seeking favors from government do obtain those favors, have less negative impact

Iran; Iraq; Jordan; Lebanon; Libya; Morocco; Syria; Tunisia; Yemen. For *South Asia*: Afghanistan; Bangladesh; Bhutan; India; Maldives; Nepal; Pakistan; Sri Lanka. For *Sub-Sahara Africa*: Angola; Benin; Botswana; Burkina Faso; Burundi; Cameroon; Cape Verde; Central African Republic; Chad; Comoros; Congo, Dem. Rep.; Congo, Rep.; Côte d'Ivoire; Eritrea; Ethiopia; Gabon; Gambia, The; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Mauritius; Mayotte; Mozambique; Namibia; Niger; Nigeria; Rwanda; São Tomé and Príncipe; Senegal; Seychelles; Sierra Leone; Somalia; South Africa; Sudan; Swaziland; Tanzania; Togo; Uganda; Zambia; Zimbabwe.

<sup>67</sup> This has been confirmed also by UNCTAD (2006, 2008), *World Investment Reports*..

on investment than those that are less *predictable*<sup>68</sup>. The authors categorized countries into three broad types: (i) those with high levels of corruption and low predictability are the worst off in terms of attracting private investment; (ii) those with high levels but greater predictability are better off than the previous; and (iii) those with low levels of corruption and high predictability are the best off. East Asia's "puzzling economies" are likely to be in the second category. In many of East Asia's economies, in fact, corruption is said to be very well organized so that the degree of predictability is relatively high. This can explain why, despite high levels of corruption, these "miracle" economies still have high levels of growth and manage to attract significantly higher levels of investment than other developing countries. On the other hand, sub-Saharan countries are likely to be in the first category, it means that they are the worst off in terms of attracting private investment and also in terms of economic growth.

More recently, the importance of the predictability of corruption in influencing economic growth has been underlined also by Rock and Bonnett (2004), as we will see soon. Here, however, we want to concentrate on another important conclusion of the same authors, who found that the relationship between corruption and investment and growth appears to be different for small and large countries<sup>69</sup>. More specifically, they argued that corruption slows growth and/or reduces investments in most developing countries, particularly small developing countries, but increases growth in the large East Asian Newly Industrialized countries (NICs), namely: China, Indonesia, South Korea, Thailand, and Japan.<sup>70</sup> According to the authors, there are several reasons which could explain why the relationship between corruption and investment and growth appears to be different for small and large countries. Firstly, large countries have relatively large internal markets and likewise large supplies of labor: this means that foreign investors are more likely to accept corruption as a way of doing business, if doing so enables them to gain unrestricted access to local markets and labor markets. Similarly, small domestic markets and small pools of labor may mean that foreign investors are likely to be less understanding of local corrupt business practices. This combination may explain why some East Asian large countries, particularly China, with relatively high levels of corruption are attracting such FDI and have such high growth rates. It may also at least partly explain why small countries, particularly those in sub-Saharan Africa, with high levels of corruption are attracting low FDI and have experienced such poor performances in terms of economic growth (*Figure 1, 2 and 3*).

### **3.2. The different experience between East Asian NICs and sub-Saharan African countries**

The UNCTAD (2007) survey on *World Investment Prospects* for the period 2007-2009<sup>71</sup> seems to confirm the Rock and Bonnett's (2004) view. In fact, according to the survey, the most important factors which are attracting the attention of foreign investors in East Asian countries are the growth of domestic markets, followed by the size of those markets, the access to the regional market and the low labor costs. On the other hand, the investment environment and government efficiency, which are largely influenced by corruption, are not affecting the attraction for investors. In sub-

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<sup>68</sup> Cuervo-Cazurra (2008), mentioned at the end of the last section, used an opposite argument to explain the paradox of transition economies (Armenia, Azerbaijan, Bulgaria, Czech Republic, Estonia, Hungary, Kazakhstan, Kyrgyzstan, Lithuania, Macedonia, Mongolia, Poland, Russia, Slovakia, Slovenia, Uzbekistan), arguing that corruption that is widely present, "*pervasive corruption*", acts as a disincentive to FDI since it increases the known costs of investing, while corruption that is uncertain, "*arbitrary corruption*", does not have such a deterring influence because it becomes part of uncertainty of operating in transition economies.

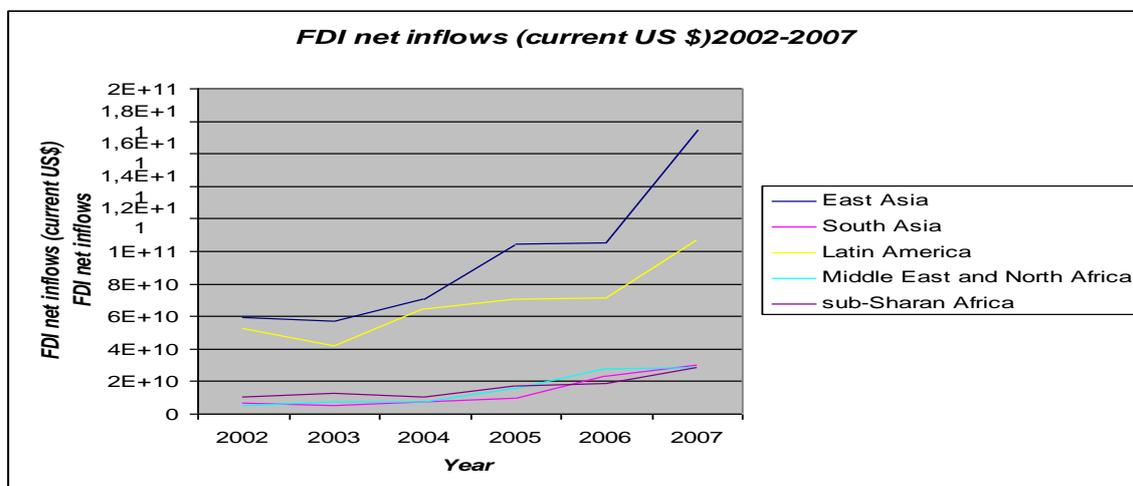
<sup>69</sup> Small countries are defined as those with population less than 20 million while large countries are those with more than 20 million people.

<sup>70</sup> Japan was included in the group of East Asian NICs, given the importance of a Japanese model of development of those countries and similarities in domestic political economies of corruption with Japan.

<sup>71</sup> The survey aims to provide an understanding of the outlook for future trends in FDI by the largest transnational corporations (TNCs) for the period 2007 to the end of 2009, on the basis of the responses of a sample of companies regarding their investment strategies. Such surveys have been carried out by UNCTAD regularly since 1995.

Saharan African countries, instead, the investment environment and government efficiency largely influence the investors' decisions; in fact, the 12% of respondents (versus 3% and 1% for East Asia ) mentioned them as important factors influencing their decisions (Table 2)

Figure 3. FDI net inflows (current US \$) in developing countries (2002-2007).



Source: Elaboration of the author. Data are from World Development Indicators 2008.

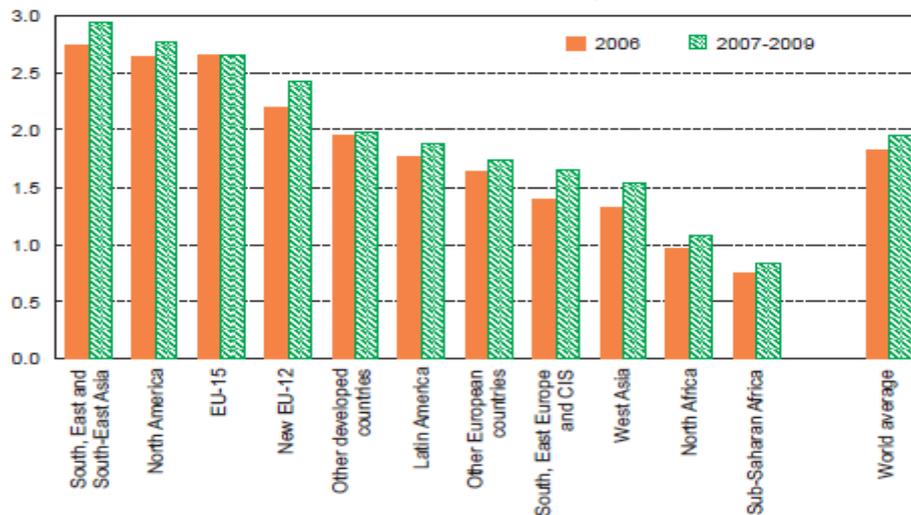
Table.2 Factors attracting investment by region in developing countries 2007-2009. (Per cent of the total number of responses for all factors in the region).

Host region/Location criteria	Skilled labour	Low-cost labour	Size of local market	Access to capital market	Access to natural resources	Access to regional market	Growth of local market	Government effectiveness	Investment environment
North Africa	4	17	17	-	25	13	21	-	4
Sub-Saharan Africa	-	6	15	-	23	9	18	12	12
West Asia	3	3	27	7	15	5	25	5	7
South, East and South-East Asia	4	8	25	1	5	12	31	1	3
Latin America	12	6	16	1	10	11	21	7	7

Source: UNCTAD (2007), World Investment Prospects Survey 2007-2009.

According to the UNCTAD (2007) survey, East Asia is increasingly considered a preferred location by enterprises, and the region is set to maintain its leading position among host regions for investments until the end of 2009, and could even reinforce its lead over the next preferred regions (the EU-15 and North America). While West Asia, North Africa and sub-Saharan Africa continue to feature lowest among companies' preferences. Also for Latin America and the Caribbean, the investment prospect is less promising (see Figure 4). Interestingly, investors identified other attractive destinations in Asia: Malaysia, Thailand and, in particular, Viet Nam, which in spite of its high levels of corruption, has been ranked sixth in the countries preferred by investors, as it has a very good reputation in terms of quality and cost of labor.

Figure 4. Investment Preferences by host region, 2006 and 2007-2009  
(Average score)\*



Source: UNCTAD (2007), *World Investment Prospects Survey 2007-2009*. \*(0 = not all important; 4 = very important).

Importantly, East Asia include the leading host country for FDI location until 2009, namely China. According to the UNCTAD (2008) *World Investment Report*, China is the sixth largest FDI host economy in the world (preceded by USA, UK, France, Canada and Netherland), and the first largest FDI host economy among developing countries. Location experts for the UNCTAD (2007) survey expressed optimism for investment prospects in this country, stressing the fact that China is among the few developing countries in the world where it is possible to find three major kinds of locational advantages (low costs, markets and technological capabilities). On the other hand, however, according to investors, this country still presents constraints in terms of its investment environment, government effectiveness and access to capital markets, all strongly influenced by corruption. This may mean a difficult sustainable attractiveness of FDI in the long period, negatively impacting the country in terms of sustainable development. We will return to this later.

Summarizing, we have shown the trueness of the Rock and Bonnett's (2004) theory, according to which corruption slows growth and/or reduces investments in most developing countries, particularly small developing countries, but increases growth in the large East Asian NICs. Effectively, in fact, foreign investors are more likely to accept corruption as a way of doing business, if doing so enables them to gain unrestricted access to large and growing local markets and cheap and skilled labor supplies. This theory can be a first plausible explanation of the "East-Asian paradox".

However Rock and Bonnett (2004) also found that country size is not the only thing that matters. In fact, they argued that "the empirical relationships between corruption, growth and investment also depend on both the industrial organization of corruption and the time horizon of those who control corruption networks" (p.1004). The importance of the impact of industrial organization of corruption networks on growth has been initially underlined by Shleifer and Vishny (1993), who claimed that when corruption networks are organized and managed by a strong centralized state, as

in a monopoly industry, corruption is likely to be less corrosive to investment and growth than when it is organized by numerous government officials acting as independent monopolists. In fact, when the latter happens, “bribes rise to infinity and growth and investment collapse” (Shleifer and Vishny, 1993: 606). So, here the question is: How might these differences in the organization of corruption networks explain the “East Asian paradox”, and more generally all the different patterns observed in *Figure 1 and 2* ? Probably, “the high-investment and high-growth outcomes of the largely corrupted East Asian NICs reflect monopoly control of corruption networks by strong over-centralized states. While the low-investment and low-growth outcomes of corrupted sub-Saharan African countries reflect control of corruption networks by competing monopolists in the government” (Rock and Bonnett: 1003).

However, differences in the industrial organization of corruption may not be able, by themselves, to completely explain the *East Asian Paradox*. According to Olson (1993), in fact, something else matters, particularly the time horizon of those who control corruption networks, namely governments. As Olson (1993: 568) put it, rational (and successful) “*stationary bandits*” (government officials) will monopolize the “*theft*” (corruption) in their “*domain*”(country) while limiting what they steal because they know they will be able to extract more in the long run if their subjects have an incentive to invest and produce additional income and wealth. Furthermore, the prospect of a future income from the monopolization of theft may even encourage governments of stationary bandits to provide the public goods that allow economic agents in stationary bandit’s countries to generate even higher incomes and more wealth. On the other hand, instead, since “*roving bandits*” have short time horizons, they have few incentives to limit corruption and no incentives to provide the public goods necessary to entice residents in their countries to invest and increase their incomes. Because of this, Olson (1993) suggested that investment and growth should be lower in countries governed by *roving bandits* than in countries governed by *stationary bandits*.

Rock and Bonnett (2004: 1004) have unified these two theories and argued that “the empirical relationships between corruption, growth and investment depend on both the industrial organization of corruption and the time horizon of those who control corruption networks”. Their findings are summarized in *Table 3*, which presents four possible growth-investment-corruption outcomes based on differences in the industrial organization of corruption and in time horizons of those who control corruption networks.

As shown in the table, corruption networks can be either monopolized by a strong centralized state or fragmented and controlled by a significant number of independent monopolists. Government officials can be either *roving bandits* with short time horizons or *stationary bandits* with long time horizons.

*Table 3. Corruption and growth regimes.*

<i>Industrial organization of corruption networks</i>	<i>Time horizon of governments officials (bandits)</i>	
	<i>Short for roving government officials (bandits)</i>	<i>Long for stationary government officials (bandits)</i>
<i>Strong centralized governments, who exert monopoly control over corruption networks</i>	<i>1.1) Business politicians in hyper-presidential regimes in Latin America (as in Argentina, Brazil, Mexico)</i>	<i>1.2) East Asia’s developmental states (China, Indonesia, South Korea, Thailand) establish beneficial relations with capitalists by providing promotional privileges in exchange for bribes and kickbacks.</i>
	<i>Effects of corruption on growth (-)</i>	<i>Effects of corruption on growth (+)</i>
<i>Weak and fragmented governments with multiple independent monopolists controlling corruption networks</i>	<i>1.3) Africa’s neo-patrimonial regimes, particularly those with substantial political instability</i>	<i>1.4) India, Philippines in the late Marcos and post-Marcos era, and in several regimes in sub-Saharan Africa, such as in Zambia under president Kaunda and Kenya under president Moi.</i>
	<i>Effects of corruption on growth (-)</i>	<i>Effects of corruption on growth (-)</i>

Source: Rock and Bonnett (2004: 1004).

In each of the combinations in *Table 3*, excluding the combination *1.2)*, corruption reduces investment and slows growth<sup>72</sup>. When corruption networks are controlled by a significant number of *roving bandits* who act as independent monopolists, as it is typical in at least some of the countries in sub-Saharan Africa, extremely weak states have been sustained by multiple patron-client networks controlled by one or more ethnic groups with extremely short time horizons (*1.3 in Table 3*). In this case, “each independent monopolist within the state extracts as much as they can and as fast as possible, from both the private sector and the state. Additionally, because those who control corruption networks expect to be replaced in a relatively short period of time, then there is little incentive to invest in public goods or develop mutually beneficial relationships with anyone in the private sector” (Rock and Bonnett, 2004: 1004).

However, this is not the only way in which corruption can reduce investment and slow growth. Corruption networks, especially the costly high-level corruption networks that predominate in a number of countries in Latin America, can also be monopolized by business-politicians turned presidents with short time horizons (*1.1 in Table 3*). These presidents, especially in Argentina, Brazil, and Mexico, have routinely demonstrated a lack of interest in public investment, except to the degree that it provides an additional opportunity for corruption, and they have routinely used their presidential powers to enrich themselves as quickly as possible. It means that these presidents used to act as *roving bandits* reducing investment and slowing growth (p. 1005).

<sup>72</sup> The authors specified that, except for the East Asian NICs, the classification of countries and regions into one of the four cells in *Table 3* is meant to be illustrative rather than definitive.

Additionally, corruption networks can be controlled by a significant number of independent monopolists in governments who tend to have long time horizons (*1.4 in Table 3*). This condition exists in India, Philippines, and in several regimes in sub-Saharan Africa, such as in Zambia under President Kaunda and Kenya under President Moi. Governments in these conditions tend to be weak and easily penetrated by their clients in civil societies who regularly use their clients in civil society to their patrons in government to extract unproductive re-distributive rents. Sometimes those rents go to some in the emerging middle classes, particularly when they are offered jobs in the public sector. Sometimes these rents go to capitalists and landlords who use their ties to their patrons in governments to gain and keep protection. In neither instance corruption is likely to exert a positive effect on investment or growth (p. 1004).

In only one of the four possible combinations, namely the combination of stationary officials and strong centralized governments (*1.2 in Table 3*), corruption should have a positive effect on investments and growth. This combination appears to “capture the essence of the role of corruption in East Asia’s large developmental states. In this states, relatively strong, stable and autonomous central governments have used their discretionary power to create, allocate and protect new property rights (promotional privileges) for new groups in civil societies (capitalists and entrepreneurs). These governments’ developmental orientation appears to have led them to take a long-run view of corruption. Because of this they have invested heavily in public goods and they exercise near monopoly control over the corruption networks they have created. This allows them to offer promotional privileges in exchange for bribes and kickbacks that they use to consolidate their political power and enrich themselves” (p. 1005).

So, we have seen that the impact of corruption on FDI and on economic growth differs among different countries, depending on the country size and on the industrial organization of corruption and the time horizon of those who control corruption networks. These observations lead us to better understand the “East Asian paradox”. But, does this paradox undermine the hypothesis that corruption reduces the flows of FDI and slows economic growth? Our answer is no, because “*whatever its nature, more corruption necessarily means less investment and lower growth*”. In fact, as noted by Campos *et al.* (1999: 1065), also “*...East Asia’s miracle economies to move on their next stage of economic development would have to reduce the level of corruption*”. The problem is that, to completely understand the impacts of corruption on developing countries, and especially on East Asian NICs, we have to consider the quality of growth and not just the size of the GDP per capita growth. It means that we have to consider the effects of corruption on economic development, and not just on economic growth.

### **3.3. The relevance of the distinction between economic growth and economic development**

Although the term economic development is sometimes used as a synonymous for economic growth, generally it is employed to describe a change in a country’s economy involving quantitative as well as qualitative improvements. It means that although the level of per capita income is an important indicator of economic growth, it has considerable limitations as a comparative measure of economic development between countries and over time. In fact, according to the New Economic View, economic development is a multidimensional concept and it has to be redefined in terms of

the “reduction or elimination of poverty, inequity, and unemployment within the context of a growing economy” (Seers, 1969). As Sen (1999) post it: “Economic growth cannot be sensibly treated as an end in itself. Development has to be more concerned with enhancing the lives we lead and the freedoms we enjoy”. It means that although corruption might have positive effects on the GDP per capita rates of growth of the East Asian NICs , this doesn’t necessary imply that the phenomenon has the same positive effects on the economic development of those countries. Thus, in presence of high levels of corruption, also the good effects of economic growth could disappear, or anyway, have a less positive impact than that which they could have without corruption.

In effect, if we look at the Gini coefficient and at the Human Development Index (HDI) of East Asian countries, we can see this<sup>73</sup>. Figures below clearly show that if we consider these measures instead of GDP per capita growth, the East Asian paradox disappears. Actually, East Asian countries have higher inequality than North African and South Asian countries. Moreover, like most of the other developing countries, they have a “medium human development”, that is higher than that of sub-Saharan Africa, but lower than that of Latin America (see Table 4, Figures 5 and 6).

**Table 4. Corruption, Gini Coefficient and HDI**

	<i>CPI 2008</i>	<i>Gini Index 2007-8<sup>1</sup></i>	<i>HDI 2007-8<sup>2</sup></i>
China	3.6	46.9	0.777
Viet Nam	2.7	34.4	0.733
Thailand	3.5	42.0	0.781
Indonesia	2.6	34.0	0.728
India	3.4	36.8	0.619
Pakistan	2.5	30.6	0.511
Mexico	3.6	46.1	0.829
Peru	3.6	52.0	0.774
Brazil	3.5	57.0	0.800
Kenya	2.1	42.5	0.362
Malawi	2.8	39.0	0.437
Ghana	3.9	40.8	0.384
Egypt	2.8	34.4	0.708
Morocco	3.5	39.5	0.646
<b><i>Data Figures 5-6</i></b>	<b><i>CPI 2002-07</i></b>		
<b><i>East Asia</i></b>	<b>3.5</b>	<b>39.4</b>	<b>0.771(medium)</b>
<b><i>South Asia and Philippines</i></b>	<b>2.5</b>	<b>37.6</b>	<b>0.611(medium)</b>
<b><i>Latin America &amp; Caribben</i></b>	<b>3.4</b>	<b>52,6</b>	<b>0.803(medium-high)</b>
<b><i>Sub-Sahara Africa</i></b>	<b>2.7</b>	<b>45.9</b>	<b>0.493(low)</b>
<b><i>Middle East and North Africa</i></b>	<b>3.1</b>	<b>37.7</b>	<b>0.699(medium)</b>

1. Gini index: a value of 0 represents absolute equality, and a value of 100 absolute inequality.

2. Human Development Index (HDI): it ranges from 0 to 1, with the higher-scoring countries having "high human development" and the lower ones having "medium human development" or "low human development".

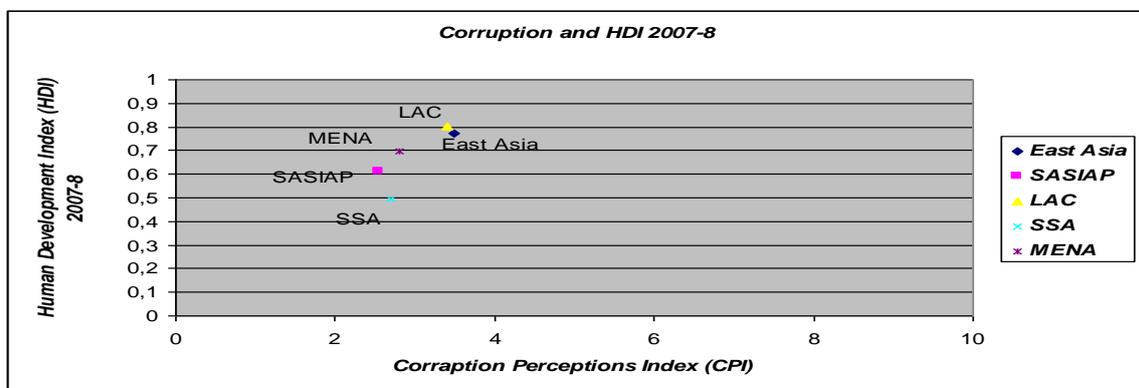
Source: Elaboration of the author. Data on Gini index and HDI are from UNDP (2007-08): Human Development Report. CPI data are from Transparency International (2008 and average 2002-07).

In China, for example, the total costs of corruption are huge. The direct economic loss owing to

<sup>73</sup> The Gini coefficient is a measure of inequality of income and wealth. The HDI is a measure of human development among these three dimensions: longevity (approximated by life expectancy), knowledge (approximated by the literacy rate), and living standard (approximated by the “log” of real GDP per capita based on PPP).

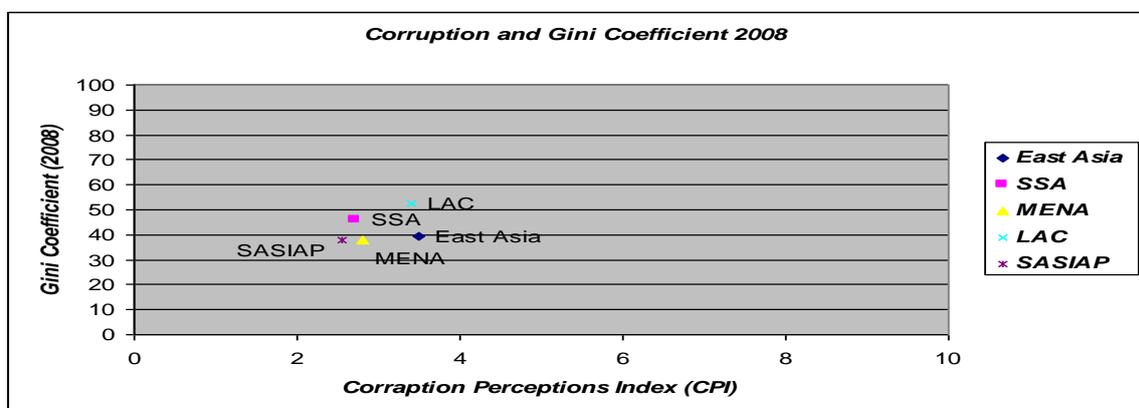
corruption represents a large transfer of wealth, at least 3 percent of GDP per year, to a tiny group of elites (Minxin Pei, 2007: 5). This annual transfer, from the poorer to the richer, is fuelling China's rapid increase in socioeconomic inequality and the public's perception of social injustice. Second, the indirect costs of corruption, efficiency losses, waste and damage to the environment, public health, education, the credibility of key public institutions are incalculable. The high price China is already paying is ample evidence that the toll of corruption is not theoretical. For example, the bill for bailing out China's state-owned banks, prime victims of corruption in the financial sector, is close to \$ 500 billion (Minxin Pei, 2007: 6). Corruption at the local level sparks uncountable insurrections and violent collective protests each year, undermining social stability and necessitating extra spending on internal security.

Figure 5. Corruption and the HDI (2007-08).



Source: Elaboration of the author. Data on HDI are from UNDP (2007-08). CPI data are from Transparency International (average 2002-07). East Asia: China, Indonesia, Thailand, South Korea, Viet Nam; SASIAP: South Asia and Philippines; LAC: Latin America and Caribbean; SSA=sub-Saharan Africa; MENA= Middle East and North Africa (see note 67).

Figure 6. Corruption and Gini Coefficient (2008).



Source: Elaboration of the author. Data on Gini coefficient are from UNDP (2007-08). CPI data are from Transparency International (average 2002-07). East Asia: China, Indonesia, Thailand, South Korea, Viet Nam; SASIAP: South Asia and Philippines; LAC: Latin America and Caribbean; SSA=sub-Saharan Africa; MENA= Middle East and North Africa (see note 67).

Corruption has also contributed to China's massive environmental degradation, deterioration in social services, and the raising costs of housing, health care, and education. As noted by Minxin Pai (2007: 5), *"so far, high savings, strong trade performance, and favorable demographics have allowed Beijing to counterbalance the direct costs of corruption and maintain growth. But corruption has lowered the quality of China's economic growth because its economic expansion has been accompanied by assorted social ills, many of which will require heavy investment to correct. With a lower level of corruption, China would have achieved growth of a higher quality, with much less damage to the economic efficiency, public health, social stability and environment. High-quality growth is more sustainable than low-quality growth"* (Minxin Pei, 2007: 5).

Moreover, also the other East Asian countries, namely Japan, South Korea, Taiwan, Thailand and Indonesia, have all paid an high price for corruption. South Korea, Thailand, and Indonesia experienced spectacular financial collapses during the Asian financial crises a decade ago, in part due to the substantial corruption in their financial and corporate sectors. Japan's economy stagnated for a decade, and corruption scandals have caused financial strains in the banking sector and contaminated the entire political establishment.

Therefore, as underlined by Campos *et al.* (1999: 1065), *"whatever the degree of predictability (dependent on industrial organization of corruption and the time horizon of governments), more corruption necessarily means less investment and less economic growth. Hence, to justify corruption on the basis of the East Asian paradox is misleading. There still is much to learn about corruption and economic development. Research on this matter is very much in a nascent stage<sup>74</sup>. One issue that certainly needs studying is the implication of highly organized (and thus more predictable) forms of corruption for sustaining high rates of growth....The implication here is that for East Asia's miracle economies to move on their next stage of economic development, they would have to reduce the level of corruption"*.

Summarizing, we have argued that high economic growth, such as that of East Asian NICs, does not necessary mean economic development. In fact, the research into the consequences of corruption on growth in GDP per capita and the constituents of growth have provided many useful and important insights, but there still remains a lot to learn about the links among welfare, sustainable development and corruption. Ultimately, development is about sustainable improvements in human welfare, and it is widely recognized that GDP per capita is not a complete measure of this.

In recent years, progress has been made in constructing empirical measures of sustainability and in developing the underlying theory (Dasgputa, 2001; Hamilton and Clemens, 1999). Sustainable development is related to an economy's ability to maintain living standards through time. More precisely, Arrow *et al.* (2004) suggest that an economy is sustainable at a given point in time if its intertemporal social welfare at that time is not decreasing. The most important determinant of intertemporal social welfare is an economy's productive base. This base consists of all its capital

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<sup>74</sup> The authors have written this in 1999, but also today the research on this matter is scarce.

assets, including manufactured capital, human capital, natural capital, and the knowledge base, and its institutions. The change in the productive base is called *genuine investment*. It can be expressed as the sum of values of investment or disinvestment in the underlying capital assets, where the assets are priced at the social opportunity cost<sup>75</sup>. As shown by Dasgputa and Maler (2000), intertemporal social welfare is non-decreasing if and only if genuine investment is non-negative. “*Thus, if one can in some way measure empirically genuine investment or, equivalently, the change in an economy’s genuine wealth over time, then one can start asking questions about sustainable development and its links to corruption*” (Aidt, 2009: 284). Based on the recent work of Dasgputa (2001) on genuine wealth, Aidt (2009) took the first step in that direction and presented some new results that show a strong negative correlation between corruption and growth in genuine wealth per capita. “*This correlation is surprisingly robust. In particular, it applies equally to perceived corruption and to managers’ actual experience with corruption*”<sup>76</sup>... moreover it demonstrates the fact that *corruption is a likely source of unsustainable development*” (Aidt, 2009: 272).

#### **4. Corruption and Organized Crime**

We believe that nowadays more than ever, it is important to admit that corruption is not an isolated phenomenon, but it is strongly related to organized crime. Because of weak institutions and fragile laws, in countries where corruption is widespread, also organized crime is widespread. Consequently, differently from what has been done until now, it is necessary to study the effects of the two phenomena jointly considered, rather than the effects of each phenomenon singularly considered.

##### **4.1. Review of the theoretical literature on organized crime**

Organized crime is present in almost every country in the world. In addition to the well-known Italian and American mafias, examples include the Yakuza in Japan, the Triads in Hong Kong, Green Gang in Shanghai, Colombian and Mexican drug cartels, numerous groupings in post-Soviet states, youths gangs in Los Angeles, New York, Soweto and San Paolo<sup>77</sup>.

As with corruption, one of the difficulties of studying organized crime is how to define it. Organized crime is, in fact, complex to define and measure because it is usually carried out clandestinely and away from the public eye and records. A good starting point to define and measure organized crime is to think about the nature of its economic activity and its relationship with the legal economy and the political process<sup>78</sup>.

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<sup>75</sup> Based on the work of Hamilton and Clemens (1999), the World Bank has for the last 10 years published measures of genuine investment. See *World Development Indicators* (various years). The World Development Indicators use the term “genuine saving”. Here, we follow Arrow *et al.* (2004) and Aidt (2009) and use the term “genuine investment”.

<sup>76</sup> We have discussed the difference between perceived-indices and WBES in *Section 2*.

<sup>77</sup> For the Italian mafias see Arlacchi (1986); Hess (1993) and Gambetta (1993). For the American Mafias see Reuter (1995) and Jacobs *et al.* (1999). For the Russian and Japanese mafias see Varese (2001) and Hill (2006), respectively. All cited in Kumar and Skaperdas (2008).

<sup>78</sup> An anthology of definitions on organized crime, together with a rich bibliography on the subject, can be found in Lampe (2006, 2008), cited in Daniele 2009.

The economic activity of organized crime varies from the manufacturing and sale of illegal goods and services (such as drugs, arms, gambling, prostitution, etc..) to the trade of legal goods and services (such as, for example, construction, rubbish collection, food distribution, etc..), to protection and extortion (Konrad and Skaperdas, 1998: 461). The United Nations Convention against Transnational Organized Crime adopts a wide-ranging definition to describe an organized criminal group, defining it as “*a structured group, committing serious crimes for profit*”.<sup>79</sup>

With the term organized crime we refer here to the definition accepted by the majority of criminologists who describe organized crime as criminal activities for material benefit by groups that engage in extreme violence, corruption of public officials, including law enforcement and judicial officers, penetration of the legitimate economy (e.g. through extortion and money-laundering) and interference in the political process (Kenney and Finckenauer, 1995; Levi, 2002, cited in Van Dijk, 2007). These elements are used as operational definitions by the European police community (Levi, 2002), and they are also incorporated in anti-Mafia laws of some countries, including Italy, USA, and Hungary (Fijnaut and Paoli, 2004).

To date, there has been relatively little theoretical work on the economics of organized crime. This could be partially related to the old debate on the utility of economic models for understanding individuals’ choices in non traditional areas, such as in crime<sup>80</sup>. On one hand, there were the economists of American tradition who were generally more persuaded about the possibility to develop economic models based on rational choice also for “non traditional” activities. European economists, on the other side, have normally been skeptical to adopt the typical economic tools outside traditional areas of research. This was due to the prevalent belief that individual’s behaviors in those areas could not truly be understood using the economic model of rational choice. Consequently, according to this view, individuals’ behaviors in illegal activities, not being economically rational, had to be left to a sociological analysis of pathologies and deviations (Fiorentini and Peltzman, 1995:2-4).

However, Becker’s (1968) pioneering article showed that even individuals who are involved in illegal activities, i.e. criminal activities, behave rationally. In fact, according to the Becker’s (1968) standard economic model of crime, an individual rationally decides whether or not to commit crime and how much crime to commit, by comparing benefits and costs of crime with those of alternative (legitimate) activities. Consequently, crime becomes less attractive if the government enhances the probability and severity of punishment. Or alternatively, crime becomes less attractive if there is an increase of opportunities in the legal market<sup>81</sup>. Becker’s key result was that given that imposing a

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<sup>79</sup> This very broad definition was favored over the list of the most common types of organized crime such as trafficking in drugs, arms, persons, stolen cars or protected species and terrorism (Van Dijk, 2007).

<sup>80</sup> Notice that, clearly, this debate has also influenced the economic analysis of corruption.

<sup>81</sup> As put by Becker (1968: 390): “*some individuals become criminals because of the financial and other rewards from crime compared to legal work, taking account of the likelihood of apprehension and conviction, and the severity of punishment. The amount of crime is determined not only by the rationality and preference of would-be criminals but also by the economic and social environment created by public policies, including expenditure on police, punishments for different crimes, and opportunities for employment, schooling, and training programs*”.

fine is costless, this fine should equal an individual's total wealth and be complemented by a probability of punishment to optimally deter crime. Summarizing, Becker's (1968) main contribution was "to demonstrate that optimal policies to combat illegal behavior are part of an optimal allocation of resources" and that "the economic framework becomes applicable to, and helps enrich, the analysis of illegal behavior".

Following the Beckerian approach, most of the economic analysis of crime have been focused on individual agents' optimal allocative choice between legal and illegal activities in different deterrence systems and with different opportunity costs. More specifically, as underlined by Garoupa (1997), the economic discussion on crime has been concentrated on different descriptions of optimal penalties and enforcement strategies in the context of partial equilibrium models where the normative criteria is to minimize a given welfare function which measures the social loss resulting from crime. For example, Stigler (1970), Ehrlich (1973) and Polinsky and Shavell (1979,2000), confirming Becker's(1968) result, showed that it is essential to increase enforcement efficiency and sanction severity in order to increase expected punishment and consequently reduce criminal activity.

Focusing on organized crime as a group rather than on a single criminal, the economic literature has also stressed welfare comparisons between monopoly and competitive supply of illegal activities. For example, Buchanan (1973) argued that monopoly in the supply of illegal activities is socially desirable. Backhaus (1979), instead, distinguished various cases in which Buchanan's (1973) argument is certainly not applicable.<sup>82</sup>

Shelling (1971-1984a,b) provided accurate descriptions and analysis of how a well-organized criminal group (such as the *mafia*) may be able to extort payments from firms in return for providing protection from other criminals and enforcement of property rights. In this sense, the *mafia* can be seen as an alternative tax collector and provider of public goods (i.e.: property rights protection and contract enforcement), which deprives the government of some of its tax revenues (cited in Alexeev *et al.*, 2004:376).

Grossman (1995) studied a model of a "kleptocratic" State which aims to maximize political rent by imposing taxes and supplying public services. As in Shelling (1984a,b) the criminal organization, i.e. the *Mafia*, competes in providing such services and in collecting taxes. According to the model, the competition between the State and the Mafia has the positive effect of increase net social welfare, due to the fact that in order to face the Mafia's competition the State reduces its taxation and increases the quantity of public services provided. However, the Mafia has a disruptive effect on the State's provision of public goods. If the disruption is reasonably small, its only effect is to decrease the amount of rents collected by the State. On the other hand, if the disruption is sufficiently large, the State does not collect rents and the Mafia controls the whole economy<sup>83</sup>.

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<sup>82</sup> Dick (1995) presented an analysis in which transaction costs, better than monopoly command, principally determine the activities of organized crime.

<sup>83</sup>Similarly to Grossman (1995), Alexeev *et al.* (2004) analyzed the taxation behavior of a revenue-maximizing government in the presence of the Mafia as a competing tax collector, and in the presence of tax evasion. The authors assume that firms choosing to avoid taxes must shift some of their sales underground, sustaining some costs. However, differently from Grossman (1995), in the presence of Mafia the government's optimal tax rate and revenues depend on how important public goods are for the firms. In

Although, Shelling (1984a,b) and Grossman (1995) have significantly contributed to the literature on organized crime, however they have under evaluated an important distinctive aspect of organized crime: the violence. This aspect has, instead, been analyzed by Konrad and Skaperdas (1997).

Konrad and Skaperdas (1997, 1998) studied the activity of extortion of productive enterprises by organized crime, arguing that: *“the main harm of extortion comes from the long-run erosion and distortion of useful production, as well as from the destruction of property that can occur in equilibrium”* (1998:461). The authors found also that *“gangs may increase their activity in response to increased police protection”*, moreover: *“often, but not always, forward-looking gangs induce lower resource waste than myopic gangs”* (1998:461).

Following Konrad and Skaperdas (1997), Garoupa (1997) analyzed a model in which the criminal organization is a vertical structure where the principal extracts some rents from the agents through extortion. The author introduced asymmetric information, arguing that on the basis of the principal’s information set, threats may or may not be credible. If the principal is sufficiently informed, his threats are credible and he can fully extract rents from the agents. In this case, a tougher policy should be chosen against organized crime, as argued by the standard theory. However, when the principal is not completely informed, his threats are not credible and he cannot fully extract rents from the agents, then he reacts violently. In this particular case, a tougher law enforcement policy might not be the best policy applicable against organized crime. In fact a tougher policy may induce more destruction, as *“in a sense there is competition between the government and the criminal organization to decide who is tougher, who is more frightful. As a consequence, the loss in welfare can be large”* (Garoupa, 1997: 14).

More recently, Kumar and Skaperdas (2008) argued that organized crime emerges in areas of weak state control (anarchy) or in areas with power vacuums created by geography, political, ethnic, and social distance, as well as in areas with legal vacuums that might be created by the prohibition of certain goods and services within modern states. According to the authors, though competition is good in economics, in the case of organized crime the predatory competition that is more likely to take place is harmful. The costs of organized crime include the resources expended on appropriation and predation, instead of production; investment distortions; contractual problems; and the incentives for the development of human skills that are biased towards appropriation instead of towards production (p:13).

Among the few macroeconomic studies which have provided a formalization of the impact of organized crime on local income, there are those of Centorrino and Signorino (1993, 1997). In their first work the authors used a simple model of Keynesian derivation in which, commencing from an equation of aggregate demand, a *“multiplier of the criminal expenditure”* was obtained. The

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particular, if public goods are significant, either the state’s tax rate or income from taxes are lower in the presence of Mafia than without it. On the other hand, when public goods are irrelevant, the government gains from the mafia’s taxation of the firms’ underground activities. In this case, in fact, the economies exhibit high official tax rates and low government supplying of public goods.

analysis showed that an increase in consumption of illegal goods has a depressive effect on income. In fact, illegal consumption (considered as imports) removes income from other categories. In the same paper, Centorrino and Signorino (1993) analyzed also the case in which income deriving from illegal sector is ascribable to people resident within the economy and such income represents a fraction of the consumption of illegal goods. In this case, the total impact on aggregate income depends on the value of spending of the illegal income preceptors within the economy, and on their propensity to consume. The limits of this model consist not only of the difficulties of estimating the parameters, but also of the fact that the illegal sector was made to coincide with the drug market, so that the model resulted difficult to empirically apply in the case of Italy and other States in which organized crime tends to assume different forms (extortion, for example).

Taking into account these limitations, Centorrino and Signorino (1997) developed a more advanced model, in which they analyzed the impact of the “*mafia tax*” on the economy’s financial and credit systems, and they propose estimates of money-laundering. The results showed that organized crime generates a “*fiscal gap*” due to lack of revenues. Additionally, the presence of organized crime reduces legal income, because of the depressive effects it produces on the local economy. Centorrino and Signorino (1997) estimated an equation of the impact of criminality on total fiscal revenues, accounting also for the income not produced in the economy because of the mafia’s presence. The results showed that, in Italy, the loss of revenues due to income not produced in the economy because of the mafia presence, in that year was equal to the 0.7% of GDP. To this should be added the lost fiscal revenue due to evasion induced by the same mafia presence (cited in Daniele 2009).

#### 4.2. Review of the empirical literature on crime and organized crime

The micro-theory we have summarized above has served as a framework for the majority of the empirical works on crime.

One of the first and most significant empirical analysis of crime has been that by Ehrlich (1973). The author presented a regression analysis of variations of index crimes across US states in 1940, 1950 and 1960. Precisely, the estimated log-linear equation is the following:

$$(7) \quad \ln\left(\frac{C}{N}\right) = b_0 + b_1 \ln\left(\frac{I}{C}\right) + b_2 \ln T + b_3 \ln W + b_4 \ln X + b_5 \ln NW + e.$$

Where the dependent variable is the number of reported crimes (C) of a particular type divided by the population of the state (N) in the same year.<sup>84</sup> Two deterrent variables were included in the structural equation for each type of crime: the number of imprisonments (I) divided by the number of reported crimes (C), and the average time (T) spent by offenders in jail for each category of crime. The three other variables included are socioeconomic variables which do not change for different types of crime: the median income of families in the state (W), the percentage of families

<sup>84</sup> Notice that seven different types of crime were examined: assault, rape, murder, burglary, larceny and auto theft.

who are below the half of the median income (X), and the percentage of nonwhite people in the population (NW)<sup>85</sup>.

As predicted by the Beckerian theoretical models of crime, the two deterrent variables were found to be negatively correlated to the rate of crime. Additionally, for most of the seven different types of crime, the impact of a more certain punishment on the rate of crime is greater than that of a more severe punishment.<sup>86</sup> The three socioeconomic variables, were generally found to be significant and positively correlated to the rate of crime, as expected.

Some other interesting studies based on aggregative cross-section data can be found in Sjoquist (1973), Carr-Hill and Stern (1973), Phillips and Votey (1975), Avio and Clark (1976), and Mathieson and Passell (1976)<sup>87</sup>. Notice that despite widely different datasets, these investigations have shown very similar results. The finding that punishment deters crime, in fact, is reasonably robust for different geographic areas and using different statistical techniques. However, as noted by Taylor (1978), not all the statistical findings about particular types of crimes and punishments are equally robust. In fact, a number of statistical results in this area have been shown to be particularly sensitive to the chosen data set and the way the data set is employed to obtain statistical estimates (p: 66). After the evaluation of the cross section studies discussed above and some time series studies ( i.e.: Ehrlich, 1975; Passel and Taylor, 1977; and Forst *et al.*, 1977), Taylor (1978) concluded that :*"...much additional research is required to clarify a number of important issues before the results can be used with any confidence. To mention a few: the theoretical rationale for including or excluding variables and for using a particular functional form<sup>88</sup>, the estimation of efficient trade-offs using complete models, the quality of the data and the quantitative importance of measurement error<sup>89</sup>, and a reconciliation of time-series and cross-section results"* (p: 75). Notice that we cite Taylor (1978) not only because his work is a complete review worth to be mentioned, but also because we think that his criticisms are still valid after more than 30 years, and they still represent important inputs for further research.

Another interesting, even if dated, survey of the economics of crime deterrence can be found in Cameron (1988), from which emerged that previous empirical studies could not provide evidence that policy reduce crime, probably due to simultaneity issues. The problem of simultaneity is due to the fact that usually the criminal justice system does respond to observed crime levels. This means that higher level of control by the criminal justice system can increase following an increase of the

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<sup>85</sup>Notice that Ehrlich's (1973) analysis considered also other explanatory variables, however his basic empirical results were based on these five.

<sup>86</sup> This means to say that the magnitude (in absolute terms ) of the estimated coefficient  $b_1$  exceeds that of  $b_2$ .

<sup>87</sup> All cited in Taylor (1978). Notice that these analyses represented a wide geographic range of data: states and cities in the U.S, provinces in Canada, police districts in the U.K, counties in California, and police precincts in New York City. Moreover, some of them examined only the total crime rate, while others disaggregated by categories of crime. Approximately all the studies utilized some kind of simultaneous equation technique (generally two stage least squares), but report also ordinary least squares estimates.

<sup>88</sup>Specifically, Taylor (1978) accused a lack of theory in most of the empirical works he had reviewed. In fact, the author noticed that some studies included variables that other studies excluded, and that sometimes this inconsistency was evident even in studies by the same author. As the accurate exclusion of predetermined variables is crucial for identifying structural equations, the lack of a formal theory had convinced some critics that the empirical results were unreliable.

<sup>89</sup> We rely on recorded crime, but, as well recognized, many crimes are not reported. This is why the set of observations for crime is affected by serious measurement problems.

crime rate. Then the resulting estimate may reflect the behavior of the criminal justice system rather than that of criminals, as first observed by Taylor (1978: 59-62).

Levitt (1996, 1997, 1998) tried to solve the simultaneity problems, founding that: i) increases of prison populations seem to substantially reduce the crime rate (1996); ii) increases in the size of police forces considerably reduce violent crime, but have a smaller impact on property crime (1997); iii) juvenile offenders appear to be at least as responsive to criminal sanctions as adults (1998).

Lately, Marselli and Vannini (1997) estimated a crime equation using a panel dataset of Italian regions for the period 1980-1989. The authors considered four different categories of crime: robbery, theft, murder and fraud. The results relative to the first three categories contrasted with the predictions of the Beckerian economic model of crime, while those concerning fraud supported the traditional hypothesis. Interestingly, the authors introduced organized crime into the estimated crime equation<sup>90</sup>. Note that until then, the empirical literature on crime had usually ignored the phenomenon of organized crime.

At this point it's important to specify that complex crime (i.e. organized crime as defined at the beginning of this paragraph) must be analyzed separately from volume crime (i.e. common crime, such as robbery, theft, fraud,..). The world map of organized crime, in fact, differs fundamentally from that of common crime.<sup>91</sup> While in many western countries the level of common crime has declined, that of corruption and organized crime has not (Lambsdorff, 2006; Van Dijk, 2007). As noticed by Van Dijk and Nevala (2002), organized crime and common crime are determined by different factors at the macro level. These observations confirm that it is necessary to use different indexes in order to measure organized crime and common crime. More specifically, while it is now well-accepted that the level of common crime across countries can be effectively estimated by using standardized victimization surveys among the public (i.e: the International Crime Victim Survey, ICVS)<sup>92</sup>, the level of complex crime cannot be correctly measured using the ICVS. Some international organizations, such as the United Nations Office on Drugs and Crime and the Europol, have suggested the use of administrative data, such as the number of arrests or convictions for involvement in organized crime, as indicators of the level of these type of crimes across countries. However, number of arrests or convictions for involvement in organized crime are likely to reflect police performance rather than the true extent of criminal activities, as appropriately observed by Van Dijk (2007: 40). The case of measuring levels of crime independently of the police is even stronger with regard organized crime than regarding common crime (Van Dijk, 2007: 40). Van Dijk (2007), specified three defining characteristics of organized crime: instrumental violence, corruption of public officials and money laundering. Consequently, he constructed a Composite Organized Crime Index (OCPI) combining five interrelated proxy indicators of perceived

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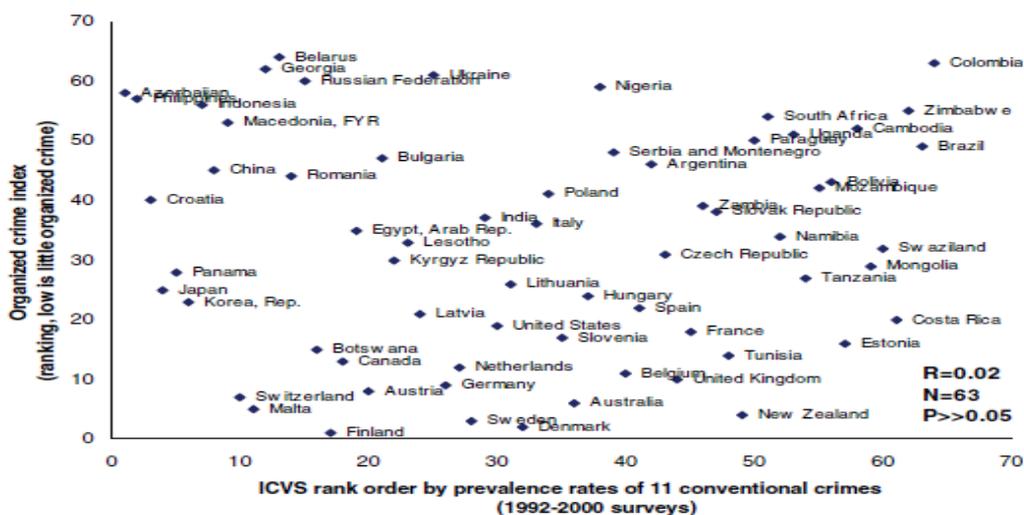
<sup>90</sup> Organized crime is proxied by the total number of homicides. Even if this is not the best measure for criminal organizations, however the authors have been the first to empirically investigate the determinants of organized crime.

<sup>91</sup> See Figures 8 a) and 8 b) in appendix for the World and European Maps of Organized Crime presented by Van Dijk (2007).

<sup>92</sup> See for example: Van Dijk *et al*, 1990; United Nations, 1999; Kury, 2001; Nieuwbeerta, 2002; Lynch, 2006. All cited in Van Dijk (2007).

prevalence of organized crime, specifically: racketeering, unsolved homicides, grand corruption, money-laundering and the extent of the black economy. The author found that the overall ICVS rates of victimization by common crime and the perceived prevalence of organized crime (measured by OCPI) were not significantly related ( $r=0.02$ ).<sup>93</sup> As clearly shown in the scatter plot in next page.

Now that we have clarified the distinction between crime and organized crime, we can continue with the literature review of empirical work on organized crime. The empirical studies we have reviewed above, starting from Erlich (1973), had mainly been conducted in order to test the validity of the Beckerian economic model of crime, more specifically to test if effectively punishment deters crime. Additionally, a large number of empirical studies aimed at examining the socio-economic determinants of crime. Many studies, for example, have focused on the relationship between unemployment and crime or on the influence of social and cultural variables on crime rates (see, e.g.: Gordon, 1971; Freeman, 2000; Levitt, 2001). However, those studies have paid less attention to the socio-economic effects of crime, and they have ignored the phenomenon of organized crime. Here, instead, we want to review the empirical analyses which have been concentrated on organized crime and on its effects on economic growth and development.



Scatterplot of ICVS conventional crimes with organized crime index (source: Van Dijk, 2007).

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<sup>93</sup> See Figures 8 a) and 8 b) in appendix for the World and European Maps of Organized Crime presented by Van Dijk (2007).

Here, instead, we want to review the empirical analyses which have been concentrated on organized crime and on its effects on economic growth and development.

Some recent studies have shown that high levels of organized crime can obstruct development and weaken the economy (see, e.g.: Peri, 2004; Centorrino and Ofria, 2008, Caruso, 2008; and Ciaccio, 2009 for the case of Italy; Brand and Price, 2000 for UK; United Nations, 2007 for Central America). For example, Peri (2004) analyzed the effects of organized crime on long-term economic growth of the Italian provinces for the period 1951-1999. The roles of several variables were examined, among which a proxy of “social capital” (civic involvement as defined by Putnam, 1993) and the level of crime proxied by murder rates. The author found strong evidence that the presence of organized crime is associated with low economic development, even after controlling for other economic and geographic factors. According to the econometric estimate, some provinces in Sicily and in Calabria had seen a growth in employment lower than 1.2% per year for forty years, because of the high crime rate.

Clearly, the presence of organized crime imposes significant economic and social costs. The costs are varied: there are those sustained by the victims (private costs), those relative to the expenses of protection and prevention or those for the police and judicial apparatus (public costs). Such costs are monetary costs and fall directly on both private individuals and on the community. In a wider sense, organized crime imposes also a different type of costs that, differently from those discussed above, are not monetary payments but consist of “*notional costs*” that society as a whole sustains in the form of lost opportunities for development, a reduction in the rates of growth or lost investment. Such costs can be compared to “*negative externality*” that bear on everyone, not only those directly interested by criminal phenomena (Daniele, 2009: p.3). For example, in the case of mafia, “external costs” derive from the infiltration of the mafia into the Institutions, from the appropriation of part of public expenditure, from the distortion of markets or from the creation of a local socio-institutional climate that is unfavorable to investment by legitimate firms. These costs can translate into lower productivity, loss of investments, the flight of companies or, more generally, on a rate of productivity growth lower than the potential (Daniele, 2009: p.3)<sup>94</sup>. Estimates of the social costs of organized crime have been obtained for some countries: for UK by Brand and Price (2000), and for Central America by United Nations (2007).

Caruso (2008) presented a panel analysis of the twenty Italian regions for the period 1997-2003. The author showed that there exist: i) a significant positive association between public investments and the index of organized crime; ii) a significant positive association between investments in real estate and the index of organized crime; iii) a significant negative association between social protection and the index of organized crime; iv) a significant negative association between private investment and the index of organized crime. Of particular interest for our empirical research, is the index of organized crime used by the author. In order to measure the extent of complex crime (i.e. organized criminality), Caruso (2008) adopted the index developed by the Italian National Institute

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<sup>94</sup> Briefly, the total costs that crime imposes include: i) private costs sustained directly by private citizens; ii) public costs which are the payments for the collective measures of prevention and suppression; iii) “*external*”, “*notional*” or “*social costs*”(Daniele, 2009: p.3)

of Statistics (ISTAT). This index has been calculated accounting for the number of murders attributable to the Italian biggest criminal associations (Mafia, Camorra and ‘Ndrangheta’), the number of bomb attacks, arsons, thefts and “serious” robberies. Notice that this index is based on events through which the organized criminality has manifested its presence. Clearly, this kind of index does not “capture” the activities which don’t have a violent materialization (Caruso, 2008: 15).

In a recent paper, Ciaccio (2009) examined the major effects of organized crime on the economy of South Italy, focusing in particular on the effects on local public services costs. The econometric analysis confirmed the hypothesis that criminal associations increase the cost of local public services, especially those of collection and disposal of waste material.

A criminal cost, which is rarely considered, derives from the fact that the criminal presence tends to discourage both domestic and foreign investment. If we think about one of the most prosperous activities of the organized criminality, which is extortion racket, we can easily understand why it increases the risks and costs of doing business (possible attacks, intimidation and the destruction of property). According to the World Economic Forum survey (WEF 2004), business executives in many high crime countries mention crime as the most or second most important impediment to doing business in their countries (cited in Daniele and Marani, 2010). Basile (2001), Paziienza *et al.* (2005), Daniele (2007) and Daniele and Marani (2010) using data on certain crimes, have shown how crime negatively influences FDI in Italian regions (cited in Daniele, 2009). Kumar and Skaperdas (2008) have shown that criminality lowers the quantity of productive investment.

Daniele and Marani (2010), for example, have examined the impact of crime on foreign direct investment (FDI) inflows in the Italian provinces, showing that crime represents a deterrent for foreign investors, suggesting that high levels of crimes may be perceived as a signal of a local socio-institutional environment unfavorable for FDI. This confirms the negative impact of organized crime on investments.

As argued before, one of the main difficulties of studying organized crime, is that it is not easy to quantify. In fact, data are often lacking and, for certain crimes, the number of complaints tends to under-report the effective dimension of the phenomenon.<sup>95</sup> In spite of these limitations, Daniele and Marani (2010) based their calculations on official data in order to estimate the incidence of different crimes. Note that not all offences are typical of organized crime: some, such as theft, corruption or sexual violence generally are not typical of criminal organizations. For these reasons, and on the basis of studies on the subject, the authors constructed an index of organized crime given by the sum of only four crimes: extortion, bomb attacks, arson and criminal associations.<sup>96</sup> To estimate the impact of crime on FDI, Daniele and Marani (2010) use panel data (observations for 103 Italian

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<sup>95</sup> For this reason, most of the scholars use perception indexes, based on surveys, to measure organized crime. See, e.g. Van Dijk and Terlouw (1996); Buscaglia and Van Dijk (2003) and Van Dijk (2007).

<sup>96</sup> Criminal associations is measured by considering the number of people denounced for criminal association (type of crimes as specified by Italian Penal Code). The sum of the four indexes is constructed per 10,000 inhabitants. All data on crime is collected by the Italian national institute of statistics (Istat).

provinces for the period 2002–2006) and different estimation procedures. The empirical study uses a log-linear equation with the following form:

$$FDI_{it} = \alpha + \beta_1 X_{i,t-1} + \beta_2 Crime_{i,t-1} + w_{it}$$

where  $i$  represents province,  $t$  time and  $w_{it} = e_i + u_{it}$  is the error term. The dependent variable is the log of FDI inflow in the provinces<sup>97</sup>,  $X_{i,t-1}$  is a set of lagged control variables<sup>98</sup>, while  $Crime$  is a measure of the incidence of crime (as illustrated above).

Economic empirical analyses on organized crime at a cross country level are almost inexistent, this is due to the fact that there are not many measures to consistently quantify the phenomenon at an international level. Buscaglia and Van Dijk (2003), Van Dijk (2007) and Sung (2004) have empirically analyzed criminal organizations for a cross-section of countries.<sup>99</sup> Notice that all these studies focus on the determinants of the phenomenon rather than on its effects on economic growth. Particularly, Van Buscaglia and Van Dijk (2003) and Van Dijk (2007) concentrate on the common determinants of corruption and organized crime, and empirically test the correlation between an index of OC and measures of the rule of law and development. Sung (2004)<sup>100</sup>, instead, evaluates two hypothesis of predatory organized crime: the State failure hypothesis and the economic failure hypothesis. The finding that a corrupt judiciary deprives a nation of effective institutional defense against organized crim, and an active underground economy provides criminal syndicates with ample opportunities to expand their influence and legitimacy among ordinary citizens. However, denial of political freedoms and high unemployment seem to do not contribute to the diffusion of OC.

In Figure 8 we show the World Map and the European Map of the Composite Organized Crime Index built by Van Dijk (2007). As specified above, this index combines five interrelated proxy indicators of perceived prevalence of organized crime, specifically: racketeering, unsolved homicides, grand corruption, money-laundering and the extent of the black economy.<sup>101</sup> The World Map clearly shows that in Asia rates are the worst in parts of South Asia (Pakistan, Bangladesh), but also China and India are rated unfavorably. In the international literature India is rarely the focus of attention. Research on Chinese organized crime is mainly focused on Chinese expatriates. Relatively to homeland China, the limited research that is available concentrates on the collusion between corrupt communist party members and local gangs in remote areas (i.e. Zhang, 2001). This seems to show that more research on the role of organized crime-corruption in these two emerging superpowers is needed. With regard to Africa, Nigeria, Angola and Mozambique have the highest scores. Nigerian organized crime activity has been well-documented, both at a national level as well as at regional level (see, e.g. Shaw, 2003; UNODC, 2005); while a detailed analysis of

<sup>97</sup>The data on FDI inflow in the Italian provinces are collected by UIC (the Italian Office of Exchange)

<sup>98</sup> Control variables related to the economic dimension of the province are: market size as approximated by two variables: the log of the resident population in each province and the share of provincial GDP of that of the region; log of GDP per capita; a measure of the degree of openness of the provincial economy, calculated by exports of GDP and a proxy of R&D activities. Control variables related to the economic structure of the province are: share of medium and large firms (with more than 50 employees) of the total number, and the number of firms in nonagricultural sectors per 1000 people; an index of total infrastructural endowment.

<sup>99</sup> Notice that Sung (2004) has analyzed the determinants of organized crime, but not its effects on economic growth.

<sup>100</sup> The OC index used by Sung (2004) is that provided by the World Economic Forum. The same we use for some simple statistical analyses whose results are shown in Appendix (Figure 9 and following).

<sup>101</sup> The map is drawn for 112 countries, however Van Dijk (2007) does not clearly specify the period of time for which the index has been built.

how criminal organizations penetrate state and businesses in southern Africa, notably in Mozambique, is given by Gastrow (2003). As we would expect, in Latin America, the countries with the highest scores are: Haiti, Paraguay, Venezuela and Colombia. Within Europe, organized crime prevalence increases diagonally from the north west to the south east, with low levels in United Kingdom and Germany, and higher levels in Spain and Italy. The highest scores, however, are in Russia, Albania and Ukraine. The annual surveys of the World Economic Forum point at incremental improvements in some of the new members of the European Union.

The empirical analysis of organized crime at a cross-country level may now start to develop given that the World Economic Forum has been publishing the Organized Crime Perception Index since 1997. This index is based on the perceptions of leading business executives about the country in which they operate. Organized Crime is ranked in a 1-to-7 scale survey question that asks whether the respondent perceives that racketeering and extortion are imposing significant costs on businesses. In Table 7 in Appendix we show the OC perception index ranking for 152 countries for the period 1997-2012. We also use this index in order to run important preliminary statistical analyses that confirm the positive correlation between corruption and organized crime and the negative effect that criminal organizations have on the economy (see Figure 9 and following in Appendix). From the simple correlation between the perception index of organized crime and the GDP pc, as shown in the scatterplot in Figure 9, it can clearly be seen that Italy is an outlier, characterized by a widespread criminal organizations and a rather high level of GDP pc. For this reason, and given the availability of data on Mafia-related crimes at a regional level, we will empirically investigate the effects of OC and corruption on economic growth for the case of Italy (Chapter 3).

#### **4.3. Corruption and Organized Crime: Some previous microeconomic and empirical studies**

Given the secretive nature of both corruption and organized criminal activities, it is difficult to produce data on the extent of corruption attributable to organized crime. However, evidence shows that in many parts of the world there are deep interdependent links between organized crime, politics and the public sector, developing, in extreme cases, a form of symbiosis between the state and criminal organizations.<sup>102</sup> Organized crime, in fact, usually involves the complicity or direct participation of the public sector. A lot of cases and examples suggest strong linkages between organized crime and public sector corruption, with criminal networks deeply depending on corruption to ensure the circulation of illicit goods, facilitate money laundering and racketing, and minimize the risks of prosecution. In most countries, corruption of public officials, including law enforcement and court officers, is a common activity of organized crime that consents to criminal organizations to ensure endurance and reduce the risk of being arrested and prosecuted (Van Dijk, 2007).<sup>103</sup>

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<sup>102</sup> Italy, for example, is a country traditionally known for deep interdependent links between organized crime, politics and the public sector.

<sup>103</sup> See also Shelley (1995), Buscaglia and Gonzalez-Ruiz (2002).

Shaw (2002) noted that the weakening and criminalization of the State is often a component of organized crime, with government actors (politicians) also involved in criminal activities. This can be observed in countries like Nigeria, Liberia and Ghana. More recently, Mazzitelli (2007) explored the different factors that contribute to criminal activities in West Africa, founding that organized crime is determined by inequalities in wealth, high population growth, rapid and uncontrolled urbanization, natural resources economies and “patrimonial” conception of the state. Moreover, the author affirmed that West Africa is an ideal place for structured criminal networks since risks are reduced as a result of poor governance: weak state institutions, weak rule of law and enforcement agencies. Sergi and Querimi(2007) studied the relationships between corruption and socio-economic development and between organized crime and socio-economic development, in the context of South-East Europe. The authors noted that both corruption and organized crime are prevalent in the region, stressing that the key problem is a weak rule of law (i.e. inefficient judicial systems and weak enforcement control).

From what we have argued above, the connections between organize crime and corruption seems to be very clear; although most experts highlight their interdependent nature, the research explicitly focusing on the links between the two phenomena is still poor and incomplete (especially from a macroeconomic point of view), as well as the research focused on their combined effects on economic growth and development. Most of the literature, in fact, focus on the microeconomic aspects of the problem or empirical evidence.

As we have seen in the previous paragraph, the literature on crime has emphasized the deterrence ability of the justice system on criminal activities (e.g. Becker 1968; Ehrlich, 1973; Polinsky and Shavell, 1979). However, expected penalty depends not only on the strictness of sentences but also on the probability of conviction once crime is committed. The last depends on detection by the police, prosecution by legal representatives and the deliberation of judges and juries. As long as these three activities are carried out transparently and efficiently, sanctions will deter criminal activities. However, if corruption is pervasive, the efficiency in law enforcement can be very much reduced (Kugler *et al.*, 2003: 3).

In fact, as firstly recognized by Becker and Stigler (1974), the effectiveness of the enforcement system is reduced if the amount of bribes paid by the criminal to corrupted public enforcers is significantly less than the monetary equivalent of punishment to which the criminal would incur if convicted. Clearly, this means that bribes reduce punishment and therefore deterrence. Following this result the authors made two proposals in order to improve the quality of enforcement: rising the salaries of public enforcers<sup>104</sup> or paying private enforcers for performance<sup>105</sup>.

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<sup>104</sup> Becker and Stigler (1974) suggested to increase the salaries of enforces above what they could get elsewhere, by an amount that is inversely related to the probability of detection, and directly related to the size of bribes and other benefits from malfeasance (pag.6).

<sup>105</sup> Landes and Posner (1975) and Polinsky (1980) argued that the use of private enforcers might generate excessive enforcement.

After Becker and Stigler's (1974) preliminary work, the literature on crime has started to consider the problem of bribed officials.<sup>106</sup> Some other authors have also proposed the payment of efficiency wages to prevent bribe taking (see, e.g. Besley and McLaren, 1993; Mookherjee and Png, 1995).

Bowles and Garoupa (1997) complemented the ideas developed by Becker and Stigler (1974) by extending Becker's (1968) standard economic model of crime and allowing for complicity between an arresting officer and the criminal at the expense of the police department. However, differently from Becker and Stigler (1974), they focused on the effects of bribery on the optimal allocation of resources (accounting for social costs of both crime and corruption). Their result is that in the presence of corruption some of the Becker's (1968) outcomes may no longer be valid. In particular, they showed that the maximum fine may no be optimal.

More recently, Chang *et al.* (2000) revisited Bowles and Garoupa's (1997) model by introducing subjective psychological costs and by including among these the social norms in the police officer community. The authors demonstrated that when corruption is widespread, social norms are no longer a sufficient sanction against corrupt officers, and the rise of fines can actually result in more crime. Kugler *et al.* (2003) adopted a different approach, focusing on the relationship between organized crime, corruption and punishment in the context of imperfect competition. They analyzed "*the role of corruption not only in reducing deterrence but also as a strategic complement to crime and therefore a "catalyst" to organized crime*" (p:4). The main result of this analysis was that if corruption is costly due to law enforcers being well-paid, hard to bribe and easily detected when accepting payments, then stronger policies or tougher sanctions are always effective in reducing crime, as predicted by the standard literature. However, when bribing costs are low, that is badly-paid and dishonest law enforcers work in a weak government, and the rents from criminal activities are sufficiently high compared to those from legal activities, increasing policing and sanctions can actually generate higher rates of crime.

The literature we have just reviewed focuses on microeconomic aspects of the interdependent nature of organized crime and corruption. However, there are also some empirical studies which have analyzed the issue. One of these studies is that developed by Buscaglia and Van Dijk (2003), who confirmed the link between organized crime and public sector corruption by analyzing qualitative and quantitative information on a large sample of countries. The authors constructed a composite index of organized crime which included indicators of five core activities (trafficking in persons, arms, stolen vehicles, cigarettes and fraud) and four secondary factors (costs for businesses, extent of the informal economy as a proportion of GDP, violence and money laundering). Based on statistical analysis<sup>107</sup> of a sample of countries, this study indicates that organized crime is more prevalent in countries where the rule of law is weak, with only few exceptions to this rule. According to this study, critical determinants of organized crime are the quality, independence and integrity of the institutions safeguarding the rule of law, including police services and the judiciary, at all levels of development. Independently of these institutional

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<sup>106</sup> For a survey on law enforcement, see Polinski and Shavell (2000), cited in Kugler *et al.* (2003).

<sup>107</sup> Simple correlations between the indexes.

determinants, high levels of corruption and organized crime are consistently linked to low levels of human development.

A further study by Van Dijk (2007) confirms and refines the initial findings. A composite index of organized crime was constructed, combining data on the perceived prevalence of organized crime, unsolved homicides, grand corruption, money laundering and the extent of the black economy as markers of organized crime presence.<sup>108</sup> The findings seem to confirm the interrelations between organized crime, law enforcement, rule of law and economic development. When organized crime is prevalent, law making tend to serve the interests of few instead of the general interest, undermining market efficiency and public reliance in the legal and regulatory functions of the state.

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<sup>108</sup> Measures and indexes taken from World Economic Forum's annual survey, official crime statistics, World Bank Institute governance indicators (for more details see Figure 8a- 8b in Appendix).

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Appendix

Table 5. The Corruption Perceptions Index (CPI)\*

		1996	1997	2006	2007	2008	2012	
Rank 2008								Rank 2012
1	Denmark	9.3	9.9	9.5	9.4	9.3	90	1
1	New Zealand	9.4	9.2	9.6	9.4	9.3	90	1
1	Sweden	9.1	9.3	9.2	9.3	9.3	88	4
4	Singapore	8.8	8.7	9.4	9.3	9.2	87	5
5	Finland	9.1	9.5	9.6	9.4	9	90	1
5	Switzerland	8.8	8.7	9.1	9	9	86	6
7	Iceland	-	-	9.6	9.2	8.9	82	11
7	Netherlands	8.7	9	8.7	9	8.9	84	9
9	Australia	8.6	8.9	8.7	8.6	8.7	85	7
9	Canada	9	9.1	8.5	8.7	8.7	84	9
11	Luxemburg	-	-	8.6	8.4	8.3	80	12
12	Austria	7.6	7.6	8.6	8.1	8.1	69	25
12	Hong Kong	7	7.3	8.3	8.3	8.1	77	14
14	Germany	8.3	8.2	8	7.8	7.9	79	13
14	Norway	8.9	8.9	8.8	8.7	7.9	85	7
16	Ireland	8.5	8.3	7.4	7.5	7.7	69	25
16	United Kingdom	8.5	8.3	8.6	8.4	7.7	74	17
18	Belgium	6.8	5.3	7.3	7.1	7.3	75	16
18	Japan	7.1	6.6	7.6	7.5	7.3	74	17
18	USA	7.7	7.6	7.3	7.2	7.3	73	19
21	Saint Lucia	-	-	-	6.8	7.1	71	22
22	Barbados	-	-	6.7	6.9	7	76	15
23	Chile	6.8	6.1	7.3	7	6.9	72	20
23	France	7	6.7	7.4	7.3	6.9	71	22
23	Uruguay	-	-	6.4	6.7	6.9	72	20
26	Estonia	-	-	6.7	6.6	6.9	64	32
27	Slovenia	-	-	6.4	6.6	6.7	61	37
28	Qatar	-	-	6	6	6.5	68	27
28	St. Vincent & Grenadines	-	-	6	6.1	6.5	62	36
28	Spain	4.3	5.9	6.8	6.7	6.5	65	30
31	Cyprus	-	-	5.6	5.3	6.4	66	29
32	Portugal	6.5	7	6.6	6.5	6.1	63	33
33	Dominica	-	-	4.5	5.6	6	58	41
33	Israel	7.7	8	5.9	6.1	6	60	39

35	United Arab Emirates	-	-	6.2	5.7	5.9	68	27
36	Botswana	-	-	5.6	5.4	5.8	65	30
36	Malta	-	-	6.4	5.8	5.8	57	43
36	Puerto Rico	-	-	-	-	5.8	63	33
39	Taiwan	5	5	5.9	5.7	5.7	61	37
40	<b>South Korea</b>	5	4.3	5.1	5.1	5.6	56	45
41	Mauritius	-	-	5.1	4.7	5.5	57	43
41	Oman	-	-	5.4	4.7	5.5	47	61
43	Bahrain	-	-	5.7	5	5.4	51	53
43	Macao	-	-	6.6	5.7	5.4		
45	Bhutan	-	-	6	5	5.2		63
45	Czech Republic	5.4	5.2	4.8	5.2	5.2	49	54
		<b>1996</b>	<b>1997</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2012</b>	
<b>Rank 2008</b>								
47	Cape Verde	-	-	-	4.9	5.1	60	39
47	Costa Rica	-	-	4.1	5	5.1	54	48
47	Hungary	4.9	5.2	5.2	5.3	5.1	55	46
47	Jordan	4.9	-	5.3	4.7	5.1	48	58
47	Malaysia	5.3	5	5	5.1	5.1	49	54
52	Latvia	-	-	4.7	4.8	5	49	54
52	Slovakia	-	-	4.7	4.9	5	46	62
<b>54</b>	<b>South Africa</b>	5.7	5	4.6	5.1	4.9	43	69
55	<i>Italy</i>	3.4	5	4.9	5.2	4.8	42	72
55	Seychelles	-	-	3.6	4.5	4.8	52	51
57	Greece	5	5.4	4.4	4.6	4.7	36	94
58	Lithuania	-	-	4.8	4.8	4.6	54	48
58	Poland	5.6	5.1	3.7	4.2	4.6		
58	Turkey	3.5	3.2	3.8	4.1	4.6	49	54
61	Namibia	-	-	4.1	4.5	4.5	48	58
62	Croatia	-	-	3.4	4.1	4.4	46	62
62	Samoa	-	-	-	4.5	4.4		
62	Tunisia	-	-	4.6	4.2	4.4	41	75
65	Cuba	-	-	3.5	4.2	4.3	48	58
65	Kuwait	-	-	4.8	4.3	4.3	44	66
67	El Salvador	-	-	4	4	3.9	38	83
67	Georgia	-	-	2.8	3.4	3.9	52	51
67	Ghana	-	-	3.3	3.7	3.9	45	64
70	Colombia	2.7	2.2	3.9	3.8	3.8	36	94
70	Romania	-	-	3.1	3.7	3.8	44	66

72	Bulgaria	-	-	4	4.1	3.6	41	75
<b>72</b>	<b>China</b>	2.4	2.9	3.3	3.5	3.6	39	80
72	Macedonia	-	-	2.7	3.3	3.6	43	69
72	Mexico	3.3	2.7	3.3	3.5	3.6	34	105
72	Peru	-	-	3.3	3.5	3.6	38	83
72	Suriname	-	-	3	3.5	3.6	37	88
72	Swaziland	-	-	2.5	3.3	3.6	37	88
72	Trinidad and Tobago	-	-	3.2	3.4	3.6	39	80
80	Brazil	3	3.6	3.3	3.5	3.5	43	69
80	Burkina Faso	-	-	3.2	2.9	3.5	38	83
80	Morocco	-	-	3.2	3.5	3.5	37	88
80	Saudi Arabia	-	-	3.3	3.4	3.5	44	66
<b>80</b>	<b>Thailand</b>	3.3	3.1	3.6	3.3	3.5	37	88
85	Albania	-	-	2.6	2.9	3.4	33	113
<b>85</b>	<b>India</b>	2.6	2.8	3.3	3.5	3.4	36	94
85	Madagascar	-	-	3.1	3.2	3.4	32	118
85	Montenegro	-	-	-	3.3	3.4	41	75
85	Panama	-	-	3.1	3.2	3.4	38	83
85	Senegal	-	-	3.3	3.6	3.4	36	94
85	Serbia	-	-	3	3.4	3.4	39	80
92	Algeria	-	-	3.1	3	3.2	34	105
92	Bosnia-Herzegovina	-	-	2.9	3.3	3.2	42	72
92	Lesotho	-	-	3.2	3.3	3.2	45	64
96	Sri Lanka	-	-	3.1	3.2	3.2	40	79
96	Benin	-	-	2.5	2.7	3.1	36	94
		<b>1996</b>	<b>1997</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2012</b>	
<b>Rank 2008</b>								<b>Rank 2012</b>
96	Gabon	-	-	3	3.3	3.1	35	102
96	Guatemala	-	-	2.6	2.8	3.1	33	113
96	Jamaica	-	-	3.7	3.3	3.1	38	83
96	Kiribati	-	-	-	3.3	3.1		
102	Mali	-	-	2.8	2.7	3.1	34	105
102	Bolivia	3.4	2.1	2.7	2.9	3	34	105
102	Djibouti	-	-	-	2.9	3	36	94
102	Dominican Republic	-	-	2.8	3	3	32	118
102	Lebanon	-	-	3.6	3	3	30	128

102	Mongolia	-	-	2.8	3	3	36	94
102	Rwanda	-	-	2.5	2.8	3	53	50
102	Tanzania	-	-	2.9	3.2	3	35	102
109	Argentina	-	-	2.9	2.9	2.9	35	102
109	Armenia	-	-	2.9	3	2.9	34	105
109	Belize	-	-	3.5	3	2.9		
109	Moldova	-	-	3.2	2.8	2.9	36	94
109	Solomon Islands	-	-	-	2.8	2.9		
109	Vanuatu	-	-	-	3.1	2.9		
115	Egypt	2.8	2	3.3	2.9	2.8	32	118
115	Malawi	-	-	2.7	2.7	2.8	37	88
115	Maldives	-	-	-	3.3	2.8		
115	Mauritania	-	-	3.1	2.6	2.8	31	123
115	Niger	-	-	2.3	2.6	2.8	33	113
115	Zambia	-	-	2.6	2.6	2.8	37	88
121	Nepal	-	-	2.5	2.5	2.7	27	139
121	Nigeria	0.7	1.8	2.2	2.2	2.7	27	139
121	Sao Tome and Principe	-	-	-	2.7	2.7	42	72
121	Togo	-	-	2.4	2.3	2.7	30	128
121	<i>Viet Nam</i>	-	-	2.6	2.6	2.7	31	123
126	Eritrea	-	-	2.9	2.8	2.6	25	150
126	Ethiopia	-	-	2.4	2.4	2.6	33	113
126	Guyana	-	-	2.5	2.6	2.6	28	133
126	Honduras	-	-	2.5	2.5	2.6	28	133
126	<b>Indonesia</b>	<b>2.7</b>	<b>2.7</b>	<b>2.4</b>	<b>2.3</b>	2.6	32	118
126	Libya	-	-	2.7	2.5	2.6	21	160
126	Mozambique	-	-	2.8	2.8	2.6	31	123
126	Uganda	2.7	-	2.7	2.8	2.6	29	130
134	Comoros	-	-	-	2.6	2.5	28	133
134	Nicaragua	-	-	2.6	2.6	2.5	29	130
134	Pakistan	1	2.5	2.2	2.4	2.5	27	139
134	Ukraine	-	-	2.8	2.7	2.5	26	144
134	Liberia	-	-	-	2.1	2.4	41	75
138	Paraguay	-	-	2.6	2.4	2.4	25	150
138	Tonga	-	-	-	1.7	2.4		
141	Cameroon	2.5	2.3	2.3	2.4	2.3	26	144
141	Iran	-	-	2.7	2.5	2.3	28	133
141	Philippines	2.7	3.1	2.5	2.5	2.3	34	105
141	Yemen	-	-	2.6	2.5	2.3	23	156
145	Kazakhstan	-	-	2.6	2.1	2.2	28	133
145	Timor-Leste	-	-	2.6	2.6	2.2	33	113

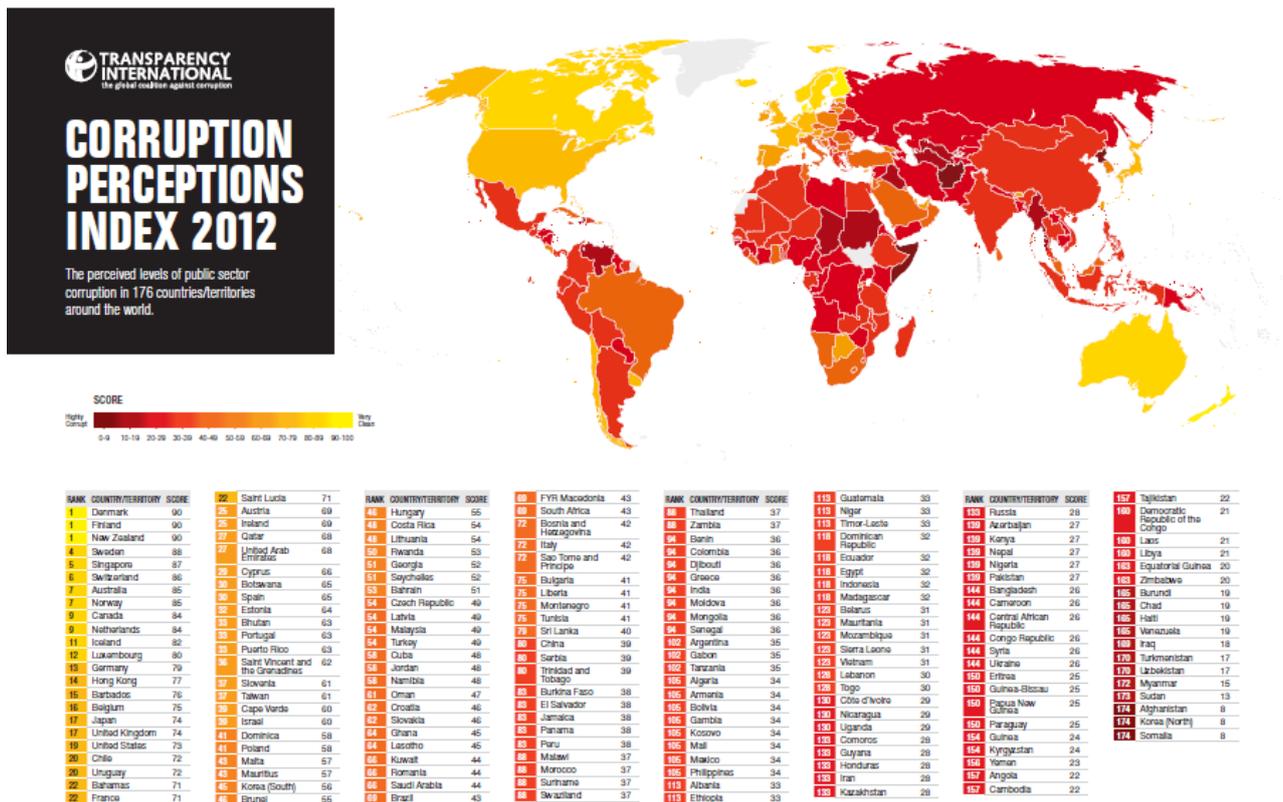
147	Bangladesh	-	-	2	2	2.1	26	144
		<b>1996</b>	<b>1997</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>		
<b>Rank 2008</b>								<b>Rank 2012</b>
147	Kenya	2.2	2.3	2.2	2.1	2.1	27	139
147	Russia	2.6	2.3	2.5	2.3	2.1	28	133
147	Syria	-	-	2.9	2.4	2.1	26	144
147	Belarus	-	-	2.1	2.1	2	31	123
147	Central African Republic	-	-	2.4	2	2	26	144
147	Cote d'Ivoire	-	-	2.1	2.1	2		
151	Ecuador	-	-	2.3	2.1	2	32	118
151	Laos	-	-	2.6	1.9	2	21	160
151	Papua New Guinea	-	-	2.4	2	2	25	150
151	Tajikistan	-	-	2.2	2.1	2	22	157
158	Angola	-	-	2.2	2.2	1.9	22	157
158	Azerbaijan	-	-	2.4	2.1	1.9	27	139
158	Burundi			2.4	2.5	1.9	19	165
158	Congo Republic	-	-	2.2	2.1	1.9	21	160
158	Gambia	-	-	2.5	2.3	1.9	34	105
158	Guinea	-	-	-	1.9	1.9	24	154
158	Sierra Leone	-	-	2.2	2.1	1.9	31	123
158	Venezuela	2.5	2.8	2.3	2	1.9	19	165
171	Congo Democratic Republic	-	-	2	1.9	1.7	26	144
166	Kyrgyzstan	-	-	2.2	2.1	1.8	28	133
166	Turkmenistan	-	-	2.2	2	1.8	17	170
166	Uzbekistan	-	-	2.1	1.7	1.8	17	170
166	Zimbabwe	-	-	2.4	2.1	1.8	20	163
166	Cambodia	-	-	2.1	2	1.8	22	157
171	Equatorial Guinea	-	-	2.1	1.9	1.7	20	163
173	Chad	-	-	2	1.8	1.6	19	165
173	Guinea	-	-	1.9	1.9	1.6	24	154
173	Sudan	-	-	2	1.8	1.6	13	173
176	Afghanistan	-	-	-	1.8	1.5	8	174
177	Haiti	-	-	1.8	1.6	1.4	19	165
178	Iraq	-	-	1.9	1.5	1.3	18	169
178	Myanmar	-	-	1.9	1.4	1.3	15	172

180	Somalia	-	-	-	1.4	1	8	174
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Source: Elaboration of the author. Data are from Transparency International.

\* A country or territory's CPI Score indicates the degree of public sector corruption as perceived by business people and country analysts, and ranges between 10 (highly clean) and 0 (highly corrupt). As you can notice, the CPI 2012 ranks 176 countries on a scale from 100 (very clear) to 0 (highly corrupt).

Figure 7. World Map of Corruption Perceptions Index (CPI, 2012)



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Source: Transparency International (2012), [http://www.transparency.org/policy\\_research/surveys\\_indices/cpi/2008](http://www.transparency.org/policy_research/surveys_indices/cpi/2008)

*Table 6. The Organized Crime Perception Index (Global Competitiveness Report-World Economic Forum) 1997-2012*

	1997	1998	2004	2007	2008	2009	2010	2011	2012
Finland	6.59	6.84	6.7	6.7	6.7	6.7	6.7	6.6	6.7
Norway	6.6	6.83	6.4	6.6	6.8	6.7	6.6	6.4	6.2
Denmark	6.59	6.71	6.7	6.7	6.8	6.8	6.6	6.8	6.1
Sweden	6.19	6.62	6.2	6.3	6.3	6.4	6.7	6.6	6
Austria	6.59	6.59	5.9	6.6	6.6	6.6	6.6	6.4	6.4
Singapore	6.76	6.5	6.6	6.5	6.6	6.7	6.7	6.7	6.7
United Kingdom	6.14	6.44	6.2	5.7	5.3	5.6	6	5.9	6
Portugal	6.64	6.28	6.4	6.5	6.5	6.2	6.2	6.2	6.2
Jordan	5.88	6.26	6.5	6.5	6.6	6.7	6.6	6.2	6.2
France	6.44	6.24	5.6	5.9	5.9	5.8	5.8	5.7	5.8
Iceland	6.33	6.17	6.9	6.7	6.8	6.8	6.8	6.8	6.5
Switzerland	6.5	6.16	6.4	6.4	6.4	6.4	6.5	6.4	6.4
Spain	6	6.13	5.4	5.3	5.6	5.5	5.6	5.7	5.8
Australia	5.68	6.11	6	6.1	6.3	6.1	6.2	6.4	6.3
Chile	6.12	6.07	5.8	6.1	6.2	6.3	5.8	5.6	5.6
New Zeland	5.95	6.04	6.5	6.4	6.7	6.6	6.5	6.4	6.6
Canada	6.17	5.97	5.4	5.6	5.9	6	5.8	5.7	5.8
Israel	6.31	5.87	6	5.8	5.6	5.8	5.6	5.4	5.6
Malaysia	5.62	5.7	5.4	5.7	5.2	5	5.2	5.5	5.4
Germany	5.51	5.64	6.2	6.5	6.2	6.2	6.3	5.9	6
Greece	5.83	5.63	5.9	6.2	6	5.6	5.6	5.5	5.3
Hong Kong SAR	5.72	5.56	6	6.2	6.3	6.2	6.2	6.2	6.1
Egypt	6	5.53	5.5	5.9	6.3	6.6	6.6	6.8	5
Luxemburg	6.4	5.5	6.2	6.1	6.5	6.8	6.8	6.7	6.8
Belgium	5.41	5.47	5.7	6.1	6.2	6.1	6.3	6.3	6.1
Netherlands	5.26	5.43	5.5	5.7	5.9	5.9	6	6.1	6.3
Korea	5.43	5.38	5.1	5.4	5.8	5.8	5.1	5.2	5.5
Turkey	4.68	5.16	4.8	4.9	4.7	4.2	4.4	4.5	4.6
United States	4.95	5.13	5.6	5	5.2	5.3	5.1	4.9	4.9
Vietnam	4.7	5.1	4.7	4.6	4.8	4.9	4.7	4.7	5
Zimbabwe	4.95	4.91	5	5.2	5.5	5.8	6.1	5.9	5.8
Taiwan	4.25	4.86	5.1	5.3	5.7	5.6	5.5	5.7	5.8
Ireland	4.87	4.83	5.8	6	6.3	6.4	6.5	6.5	6.3
India	5.05	4.74	5	5.1	5.2	5.5	5.3	5	5
Japan	5.43	4.67	5.2	5.1	4.9	5	5.3	5.6	5.4
Thailand	4.38	4.63	4.8	5.1	5.4	5.3	5.1	5.2	5.2
Indonesia	5.35	4.4	3.7	5.7	5.4	5	4.7	4.2	4.1
China	4.58	4.39	4.5	4.2	4.9	5.3	5.2	4.9	4.7
Brazil	4.5	4.35	3.9	3.3	4.1	4.2	3.9	4	4
Argentina	4.98	4.26	3.6	4.4	4.6	4.7	4.2	3.5	4.1
Hungary	3.61	3.84	5	5.5	5.6	5.4	5.3	5.4	5.4
Philippines	3.33	3.81	3.3	4.3	4.6	4.4	4.4	4.5	4.7

Poland	3.5	3.75	3.1	4.1	4.5	5.1	5.7	5.7	5.7
Venezuela	3.22	3.6	3.3	3.2	3.6	3.5	3	2.5	2.7
Czech Republic	4.61	3.59	4.6	5.5	5.9	5.9	5.8	5.5	5.4
Peru	4.06	3.58	3.8	3.9	4.4	4.6	4.3	4.1	3.9
Italy	3.73	3.13	3.4	3.6	3.6	3.4	3.7	3.5	3.5
Mexico	3.53	2.83	3.3	3.4	3.5	3.2	2.9	2.7	2.9
Slovakia	4.64	2.8	4.3	5	5.4	5.4	5.2	4.7	4.6
Russia	2.26	2.45	3.5	4	4.3	4.4	4.3	4	4.2
Ukraine	3.75	2.42	3.1	4.2	4.5	4.6	4.2	4.1	4.8
South Africa	2.35	2.09	3.8	3.9	3.6	3.8	4.3	4.2	4.3
Colombia	2	1.9	2.5	3.3	3.3	2.7	2.5	2.7	2.8
Mauritius			4.6	6.2	6.4	6.3	6.1	6.2	6.3
Costa Rica			5	5	5.2	5.2	4.7	4.1	4.9
Bolivia			4.3	4.8	4.4	4	4.2	4	3.9
El Salvador			3.7	2.3	2	2.3	2.2	1.9	1.8
Ecuador			3.6	4.4	4.6	4.4	4.3	3.8	3.6
Bulgaria			3.1	3.4	3.8	3.7	3.9	3.9	3.9
Uruguay			5.7	6.1	6.5	6.4	6.4	6.3	6
Tunisia			5.7	5.6	5.8	6.3	6.6	5.6	
Slovenia			5.6	5.7	5.9	6	6	5.8	5.8
Estonia			5.5	5.9	6	6.3	6.5	6.6	6.6
Sri Lanka			4.8	4.5	4.8	4.9	5	5.5	5.8
Botswana			5.5	5.3	5.5	5.7	5.7	5.8	6.3
Panama			5	5	5.2	5	4.5	4.5	4.8
Morocco			5.5	5.2	4.9	5.2	5.6	5.5	5.8
Namibia			4.7	4.8	5.5	5.6	5.3	5.3	5.3
Trinidad and Tobago			3.4	3.4	3.7	4.4	4.7	4.1	4.1
Nicaragua			4.8	5.1	5.1	4.4	4.4	4.4	4.2
Croatia			3.8	4.8	5.1	5.3	5.3	4.9	5.2
Dominican Republic			4.9	4.4	4.3	4.1	4.1	4.1	4.3
Romania			4.4	4.6	5	5.7	5.9	4.9	4.6
Latvia			4.8	5.7	6.2	6.3	6	5.5	5.7
Lithuania			4.1	5.3	5.9	5.9	6	5.7	5.7
Nigeria			3.8	3.4	3.7	3.8	4.2	4	3.5
Paraguay			3.7	3.9	4	4.2	4.1	3.9	4
Bangladesh			2.8	3.6	4.2	4.2	4.4	4.7	4.5
Honduras			3.7	4	4.1	3.5	3.2	3	2.7
Jamaica			2.5	2.5	3.1	3.4	3.2	3.1	3.2
Haiti								3.1	3.5
Guatemala			2.3	2.9	2.7	2.4	2.2	2	2.1
Malta			6.3	6.4	6.7	6.7	6.7	6.6	6.4
Gambia			5.3		5.9	6	5.8	5.5	5.8
Mali			5.4	4.9	4.7	4.7	5.2	5	4.4
Malawi			4.8		5.5	5.9	5.9	5.4	5.4
Ethiopia			5.4	5.4	5.6	5.5	5.7	6	6.2
Algeria			4.9	5	4.8	4.5	5.1	4.5	3.3
Ghana			5.5		5.7	5.6	5.3	5.2	5.1
Zambia			4.6	5.6	5.7	5.4	5.4	5.7	5.8

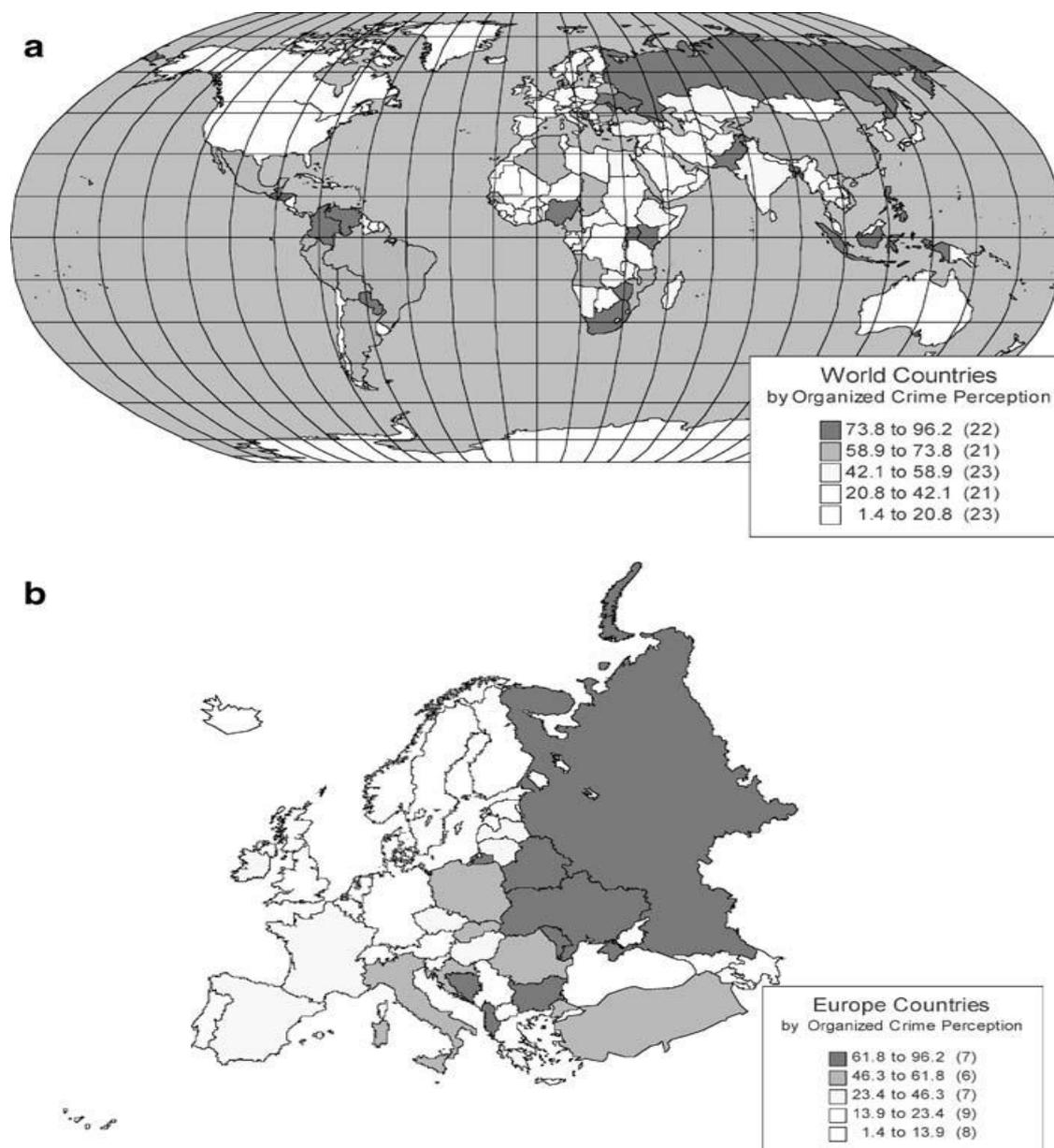
Tanzania			4.5	5.2	5.6	5.5	5.3	4.8	4.8
Angola			4.5				6	5.2	
Senegal				5.1	5.5	6.1	6	5.8	5.3
Madagascar			4.1	4	4.2	4.2	4.3	4.1	4
Pakistan			4.9	4.1	4.1	4	3.9	3.5	3.4
Serbia			4.2	4.3	4.5	4.2	4.3	4.3	4.1
Uganda			4.6		4.4	4.4	4.7	4.6	4.2
Kenya			3.4	3.8	4	3.8	4	3.8	4.2
Mozambique			3.2	3.9	4.3	4.4	4	3.9	4.1
Cameroon				4.5	4.7	4.4	5.2	5	4.7
Chad			2.9	2.9	3.1	3.5	3.8	3.8	3.5
Macedonia			2.7	3.4	4.2	4.6	4.8	4.7	4.5
United Arab Emirates			6.5	6.2	6.3	6.6	6.7	6.7	6.8
Bahrain			6.3	6.4	6.4	6.5	6.2	6.4	6.5
Cyprus			5.8	5.9	6.3	6.3	6	5.6	5.7
Bosnia and Herzegovina			4	4.6	4.8	5.1	4.8	4.2	5.2
Georgia			3.7	5.3	5.4	5.4	5.4	5.2	5.2
Qatar				6.3	6.5	6.8	6.3	5.8	6.4
Kuwait				6.3	6.2	6.3	6.3	6.2	6.2
Armenia				5.3	5.3	5.4	5.4	5.4	5.7
Mongolia				5.2	5.2	5.2	5.1	5.1	5.3
Azerbaijan				5.3	5.3	5	5	5.2	5.3
Tajikistan				4.6	5.2	5.4	5.5	5.2	5
Kazakhstan				4.6	4.6	4.8	4.8	4.4	4.9
East Timor				NA					
Benin				3.9	4.2	4.2	3.8	3.8	4.6
Kyrgyz Republic				3.8	4.2	4.2	4.4	4.4	4.5
Moldova				4.6			5.3	5.1	5
Cambodia				4.3	4.9	4.9	4.9	4.6	4.9
Guyana					4.2	4.4	4.7	4.7	4.5
Albania				3.9	4.4	4.9	5.2	5.2	4.7
Libya				6.6	6.6	6.4	5.8		6
Syria				6.6	6.7	6.8	6.7	6.7	
Barbados				6.1	6.3	6.4	6.4	6.5	6.3
Saudi Arabia				5.7	5.6	6	6.6	6.8	6.6
Mauritania				5.3	5.1	5.5	5.4	5.2	5.7
Oman				5.2	6	6.6	6.6	6.6	6.7
Montenegro				5.2	5.5	5.5	5.7	5.6	5.2
Suriname				5	5.1	5.7		5.6	5.5
Uzbekistan				4.6					
Lesotho				4.4	4.2	4.4	4.9	5	4.9
Burkina Faso				4.2	4.3	4.8	5.2	5.2	5.2
Uganda				4.1					
Burundi				4	3.7	3.5	3.9	4.2	3.9
Timor-Laste				3.6	4.1	4.3	4.2	4.6	5.3
Nepal				3.6	3.4	3.7	3.7	3.6	3.8
Brunei					6.4		6.5	6.5	6.4
Moldova					5.4				

<b>Cote d'Ivoire</b>					2.3	2.7	3.4	3.3	3.5
<b>Rwanda</b>							6.9	6.3	5.8
<b>Swaziland</b>							5.7	5.4	5.1
<b>Lebanon</b>							5.6	5.4	5.3
<b>Capo Verde</b>							4.8	4.7	4.5
<b>Iran</b>							4.6	4.8	4.9
<b>Yemen</b>								4.9	4.9
<b>Liberia</b>								4.9	
<b>Sierra Leone</b>								5.1	
<b>Guinea</b>								4.1	
<b>Belize</b>								4.3	
<b>Gabon</b>								6	

Source: Elaboration of the author. Data are from :World Economic Forum (WEF), *The Global Competitiveness Report*, various years. Most recent report: <http://www.weforum.org/reports/global-competitiveness-report-2011-2012>

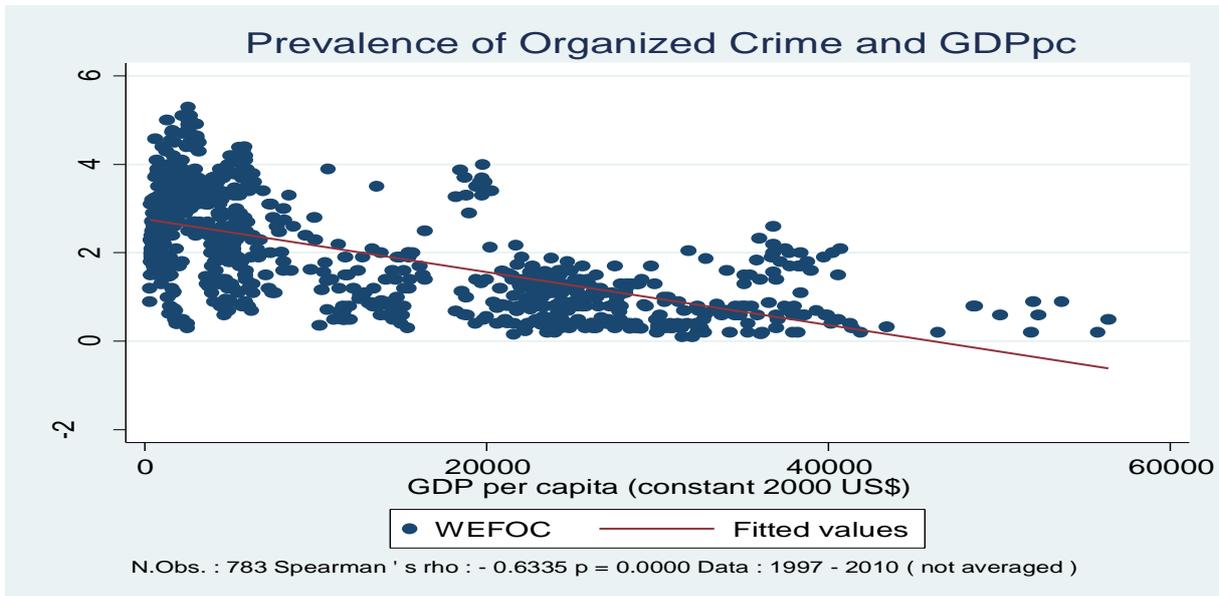
\* The organized crime perception index has been published since 1997. This index is based on the perceptions of leading business executives about the country in which they operate. Organized Crime is ranked in a 1-to-7 scale survey question that asks whether the respondent perceives that racketeering and extortion are imposing significant costs on businesses. 1=high level of OC; 7= no OC.

Figure 8. a) World Map of Organized Crime Perceptions Index  
 b) European Map of Organized Crime Perception Index\*

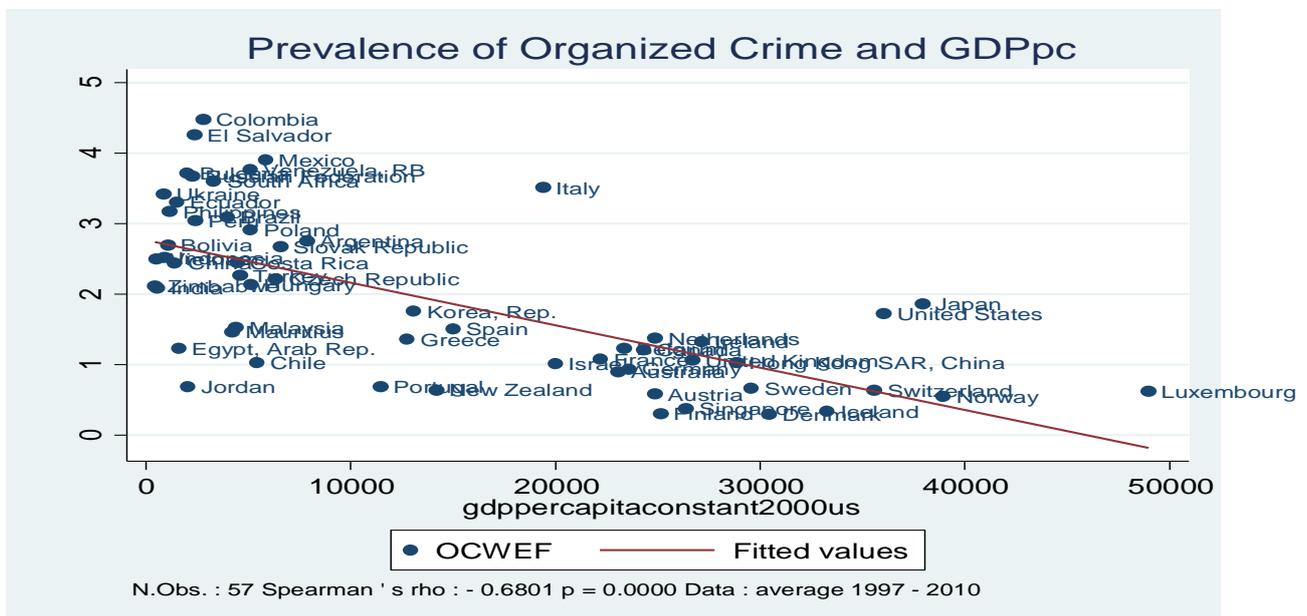


Source: Van Dijk (2007): "Mafia Makers". The author constructed a Composite Organized Crime Index (OCPI) combining five interrelated proxy indicators of perceived prevalence of organized crime, specifically: racketeering, unsolved homicides, grand corruption, money-laundering and the extent of the black economy. The Index ranks countries on a scale from 1 to 7 (1=no OC 7=high presence of Organized Crime). Sources used by the author: Organized crime perception (World Economic Forum, World Competitiveness Reports, Business Executive Surveys, 1997–2003; Merchant International Group 2004; BEEPS 1996); Money-laundering and Informal sector (World Economic Forum Business Executive Survey, 2004); High Level Corruption (Kaufmann et al. 2003), Unsolved Homicides (8th UN Survey on Crime and Justice 2002: [www.UNODC.or](http://www.UNODC.or)).

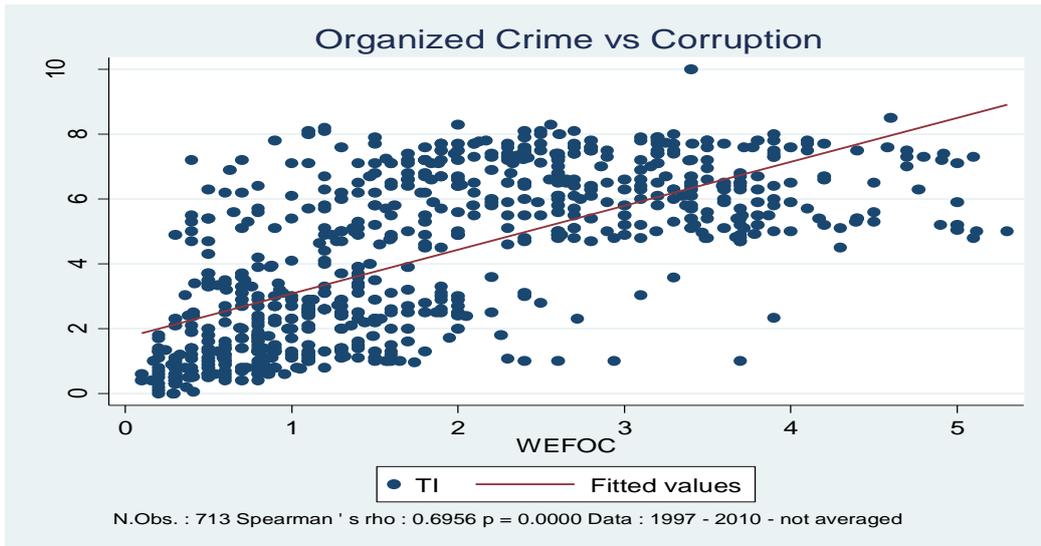
Figure 9. Organized Crime and Corruption: Preliminary Statistical Analyses for a cross-section of countries



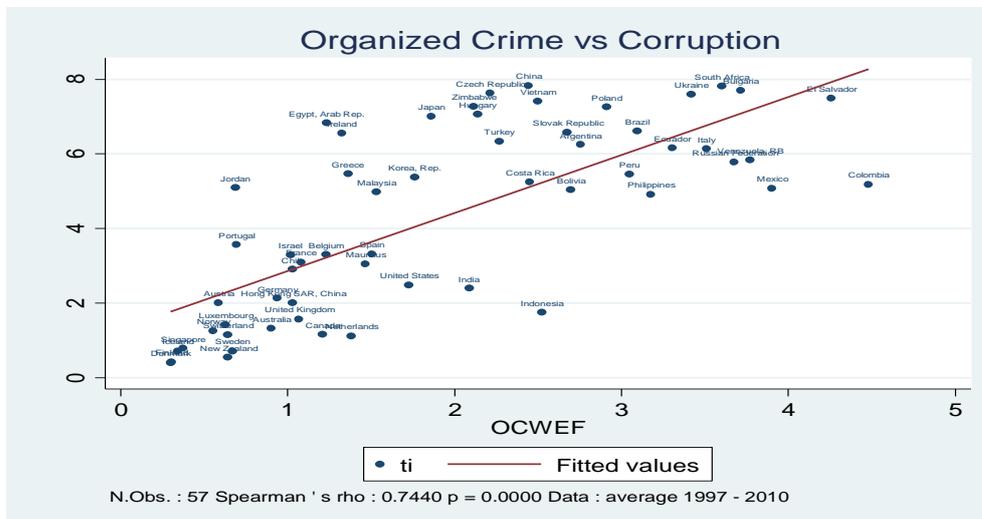
Sources: Elaboration of the author. Data on Organized Crime perception index are taken from the World Competitiveness Report (World Economic Forum) and data on GDP pc are taken from the World Development Indicators. This graph refers to 57 developed and developing countries in the period 1997-2010. See table below for the complete list of the countries included in the dataset. The scale has been inverted in order to obtain an OC Index according to which higher values correspond to an higher presence of the phenomenon (1=no OC 7=high OC).



Sources: Elaboration of the author. Data on Organized Crime perception index are taken from the World Competitiveness Report (World Economic Forum) and data on GDP pc are taken from the World Development Indicators. This graph refers to 57 developed and developing countries in the period 1997-2010. Data are here averaged in order to obtain just one observation for each country. See table below for the complete list countries included in the dataset. The scale has been inverted in order to obtain an OC Index according to which higher values correspond to an higher presence of the phenomenon (1=no OC 7=high OC).



Sources: Elaboration of the author. Data on Organized Crime perception index are taken from the World Competitiveness Report (World Economic Forum) and data on Corruption Perception Index (CPI) are taken from Transparency International (TI). This graph refers to 57 developed and developing countries in the period 1997-2010. See table below for the complete list countries included in the dataset. The scale has been inverted in order to obtain an OC Index according to which higher values correspond to an higher presence of the phenomenon (1=no OC 7=high OC), the same for the CPI.



Sources: Elaboration of the author. Data on Organized Crime perception index are taken from the World Competitiveness Report (World Economic Forum) and data on Corruption Perception Index (CPI) are taken from Transparency International (TI). This graph refers to 57 developed and developing countries in the period 1997-2010. Data are here averaged in order to obtain just one observation for each country. See table below for the complete list countries included in the dataset. The scale has been inverted in order to obtain an OC Index according to which higher values correspond to an higher presence of the phenomenon (1=no OC 7=high OC), the same for the CPI.

## List of countries

1 Finland	20 Germany	39 Venezuela, RB
2 Norway	21 Greece	40 Czech Republic
	Hong Kong ,	
3 Denmark	22 China	41 Peru
	Egypt, Arab	
4 Sweden	23 Rep.	42 Italy
5 Austria	24 Luxembourg	43 Mexico
6 Singapore	25 Belgium	44 Slovak Republic
		Russian
7 United Kingdom	26 Netherlands	45 Federation
8 Portugal	27 Korea, Rep.	46 Ukraine
9 Jordan	28 Turkey	47 South Africa
10 France	29 United States	48 Colombia
11 Iceland	30 Vietnam	49 Ireland
12 Switzerland	31 Zimbabwe	50 India
13 Spain	32 Indonesia	51 Japan
14 Australia	33 China	52 Mauritius
15 Chile	34 Brazil	53 Costa Rica
16 New Zealand	35 Argentina	54 Bolivia
17 Canada	36 Hungary	55 El Salvador
18 Israel	37 Philippines	56 Ecuador

## CHAPTER 2

# CORRUPTION AND ORGANIZED CRIME: A THEORETICAL ANALYSIS

Blackburn, Keith  
Economics and CGBCR, University of Manchester

Maria Paola Rana  
Economics and CGBCR, University of Manchester

### Abstract

There exist some studies focusing on the links between corruption and organized crime, however most of them focus on microeconomic aspects or empirical work. Much less research, instead, has been concentrated on analyzing the macroeconomics of the two phenomena jointly considered. We develop a simple framework in order to formally explain the interdependent nature of corruption and organized crime, and their combined effect on the economy. Criminal organizations co-exist with law-abiding productive agents and potentially corrupt law enforcers. The crime syndicate obstructs the legal operations of agents through extortion, and may pay bribes to law enforcers in order to avoid detection. All the agents behave rationally, they are risk neutral and take their decisions in order to maximize their profit/ payoff. We find that the amount of extortion would be higher under corruption since the mafia needs to pay bribes. In this way, the presence of both organized crime and corruption increases the costs to society by deterring more individuals from setting up business. Moreover, a possible implication of our analysis is that strengthening the fight against corruption (e.g., by increasing the probability of detection) could raise police officers' demands for bribes and thereby increase the amount of extortion even further. The suggestion, then, is to evaluate alternative strategies for combating crime and corruption.

## 1. Introduction

Almost everybody is aware of the fact that criminal organizations typically involve collusion or direct participation of the public sector. In 1994, the United Nation's Naples Declaration officially recognized that Organized Crime (OC) has a "*corrupting influence on fundamental social, economic and political institutions*", and that OC uses "*violence, intimidation and corruption to earn profit or control territories or markets*". More recently, a survey conducted by the Eurobarometer (2004), based on public perceptions of the links between corruption and OC, revealed that more than half of European citizens (54%) believe that most corruption in their country is caused by organized crime. It is not difficult, in fact, to realize that criminal systems strongly depend on corruption to carry out their activities (transport of illicit goods, money laundering, extortion, and so on) and to reduce the risk of detection and prosecution.<sup>109</sup> In 2010, a research conducted by the Center for the Study of Democracy focused on the links between Organized Crime and corruption in 27 European Member States. This investigation, based on statistical analysis of 14 indicators and on interviews, showed that criminal organizations - especially those involved in prostitution and drugs traffics- are strictly related to police forces. More specifically, throughout Europe Organized Crime (OC) uses corruption in order to have access to undisclosed information on investigations, to guarantee endurance of operations, or to develop and maintain monopoly in local markets.

The report underlined also the significant role played by political corruption, which is identified as OC's most powerful tool. Some Nations (included Italy, Greece, Romania, and Bulgaria) have experienced cases of organized crime-related corruption amongst members of Parliament or other

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<sup>109</sup> This means that corruption by OC targets on different agents: police, politicians, custom officers and judiciaries (as analyzed in detail by a research conducted by the Center for the Study of Democracy in 2010).

UN GA Resolution 49/159 Naples Political Declaration and Global Action against Organized Transnational Crime 23.12.1994

UN GA Resolution 1996/27 Implementation of the Naples Political Declaration and Global Action Plan against Organized Transnational Crime 24.07.1996

high-level politicians. However, local level political corruption seems more common. In fact, there are cases of mayors or city councilors sentenced for associations with organized and white-collar criminals in different countries, included: Italy, Greece, Spain, France, Germany, Netherlands, Hungary, Czech Republic, Bulgaria, Poland and Romania. In these cases, organized criminals use their “legitimate face” to sustain and finance politicians or directly participate to local politics. Judicial corruption by criminals, instead, seems to be less frequent than police and political corruption.

The report summarized above concentrates on European Member States; however, there is no doubt that there exist strong linkages between OC and corruption also in other parts of the world, included: US, Russia, Nigeria<sup>110</sup>, Mozambique, South Africa and Western Balkans<sup>111</sup>. In some countries criminal organizations have become so influential that they have developed the worst type of connection with corruption, by “capturing” the state. This is the case for various ex-Soviet states, parts of Latin America and China (as acknowledged by the UD Director of National Intelligence, Dennis Blair and reported by TI in 2010)<sup>112</sup>. Also Shaw (2002), has underlined that the weakening and criminalization of the State is a component of organized crime, with politicians often involved in criminal activities, as it can be observed in countries like Nigeria, Liberia and Ghana.

From what we have seen above ” *there is no question that because of corruption the scale of organized crime is much higher than it would be otherwise*”, therefore “*it is vital to attempt to increase our knowledge and understanding of collusion*” (Holmes, Transparency International

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<sup>110</sup> Shaw (2002), for example, has underlined that the weakening and criminalization of the State is a component of organized crime, with politicians often involved in criminal activities, as it can be observed in countries like Nigeria, Liberia and Ghana.

<sup>111</sup> (see examining the links between corruption and OC for papers).

<sup>112</sup> Annual Threat Assessment of US Intelligence Community; cited in Holmes 2010 for TI in Organized Crime and Corruption.

2010). Until now, in fact, the research on OC has been conducted independently from that on corruption, and the number of specific studies focused on the links between the two phenomena is very limited. Only recently the subject has attracted the attention of international institutions, such as the European Commission and the European Police Office (Europol). Few theoretical and empirical studies have shown the interdependent links between the political, socio-economic, criminal justice and legal systems<sup>113</sup>, recognizing that OC and corruption are both prevalent in an environment of bad governance, as confirmed by Buscaglia and Van Dijk (2003). More recently, Mazzitelli (2007) explored the different factors that contribute to criminal activities in West Africa, founding that this area is an ideal place for structured criminal networks since risks are reduced as a result of poor governance. Sergi and Querimi (2007) studied the relationships between the two phenomena and socio-economic development in the context of South-East Europe. The authors noted that both corruption and organized crime are prevalent in the region, stressing that the key problem is a weak rule of law (i.e. inefficient judicial systems and weak enforcement control). Nevertheless there is still large room for further investigation, especially from the economic side. So far, in fact, the economic literature, with the exclusion of some microeconomic and empirical studies, has almost ignored the issue.

We develop a simple framework in order to formally explain the interdependent nature of corruption and organized crime, and their combined effect on the economy. Criminal organizations co-exist with law-abiding productive agents and potentially corrupt law enforcers. The crime syndicate obstructs the legal operations of agents through extortion, and may pay bribes to law enforcers in order to avoid detection. All the agents behave rationally, are risk neutral and take their decisions in order to maximize their profit/ payoff. We find that the amount of extortion would be higher under corruption since the mafia needs to pay bribes. In this way, the presence of both

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<sup>113</sup> Louise I. Shelley, "Transnational organized crime: an imminent threat to the nation-state?", *Journal of International Affairs*, vol. 48, No. 2 (winter 1995), pp. 463-489.  
Samuel Gonzalez-Ruiz and Edgardo Buscaglia, "How to design a national strategy against organized crime in the framework of the United Nations' Palermo convention", *The Fight against Organized Crime* (Lima, United Nations International Drug Control Programme, 2002), pp. 23-26. All cited in Buscaglia Van Dijk 2003

organized crime and corruption increases the costs to society by deterring more individuals from setting up business. Moreover, a possible implication of our analysis is that strengthening the fight against corruption (e.g., by increasing the probability of detection) could raise police officers' demands for bribes and thereby increasing the amount of extortion even further. The suggestion, then, is to evaluate alternative strategies for combating crime and corruption.

The rest of the paper is organized as follows. Section 2 describes the model without corruption. Section 3 describes the model with corruption and Section 4 recapitulates and concludes with some remarks.

## **2. The model without corruption**

### ***2.1. Agents***

We first consider an economy free of corruption, in which law-abiding productive agents coexist with a criminal organization (i.e. the Mafia) and non-corruptible law enforcers. Individuals can choose to run a business (become entrepreneurs) or to be employed in some other routine occupation. We assume that, for some individuals, running a business is more profitable than other regular activities; however it exposes them to extortion by the Mafia. Individuals who choose to become entrepreneurs, in fact, will have to pay a sort of tax to the criminal group, with a probability  $p$ . We refer to this illegal payment as “*black tax*” (the so called *pizzo* in Italian), and we indicate it with  $x$ , where  $0 < x < 1$ . The entrepreneurs' probability of being approached by the Mafia, indicated by  $p$ , is, in other words, a measure of the criminal organization's strength in the economy. Clearly, the higher is  $p$ , the stronger is the criminal group in the economy, and vice-versa. Businessmen, who refuse to pay the so-called “*black tax*”,  $x$ , will be subject to damage,  $d$ , by the Mafia, with a probability  $p$ . This damage can be a total or partial destruction of entrepreneurs' properties (through bomb attacks or arsons), or it can be a physical attack on the individual or on his closest relatives.

The nature of the damage is not relevant; however it makes sense to assume that there is a cost of not paying the Mafiosi. This, in fact, explains why individuals pay the *pizzo* in an economy characterized by the mafia presence, in our model as in the real world.

Notice that, differently from the Beckerian approach, we do not analyze the individual choice between legal and illegal activities, but our interest is focused on the individual choice between two legal activities (business activity or routine occupation) when a Mafia-type group is present in the economy. In our model, then, individuals are potential victims of the criminal organization rather than potential members of it<sup>114</sup>. Importantly, we also assume that agents who decide to start an entrepreneurial activity can only operate above ground, so there are not underground businesses (shadow economy). This obviously implies that the Mafia can extort money only from above ground operations. These assumptions distinguish our analysis from previous studies which have, instead, assumed that individuals can choose to operate underground and that for the criminal group it is easier to tax underground transactions (e.g. Shelling, 1984; Alexeev *et al.* 1999)<sup>115</sup>.

In our model we assume that the population of law-abiding productive agents is normalized to one and uniformly distributed, and agents are risk neutral. We indicate with  $A$  the total output/revenues from the business activity and with  $e$  the cost/effort to produce this output. We assume that some individuals are more productive than others, meaning that the cost of business  $e$  is not the same for all individuals, but it is lower for some of them. This explains why not everyone becomes entrepreneur, but only those who have lower costs  $e$ , for which running a business is more profitable than some other routine occupation. In fact, if we indicate with  $a$  the income from other routine occupations (exogenously fixed), it is clear that, in the absence of the Mafia, only individuals for which  $A - e > a$ , will decide to start a business. Note that we are assuming that the alternative occupations do not imply costs, not start-up costs ( $e$ ) and not mafia costs ( $x$ ), meaning

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<sup>114</sup> Also when we examine the Mafia behavior, even if we follow the Beckerian approach when assuming that the Mafia is rational in its choices, the type of choices we are interested in is not the individual choice between legal and illegal activities. However, we have to underline that, since we assume that there exists a mafia group with a probability  $p$ , and since when the criminals' probability of being detected and the severity of the penalty to which they are subject if convicted are really high,  $p$  can be equal to zero, we are effectively analyzing the individual rational choice to engage in illegal activities, even if we don't take into account the alternative occupations for criminals.

<sup>115</sup> Schelling's argument was that underground firms cannot ask the state to protect them against criminals. Therefore, underground firms had both greater need for the mafia's services (protection against other criminals) and less opportunity to resist extortion by the mafia itself.

that other activities are not subject to extortion by the criminal group, as it is often (if not always) the case in reality. We also assume that all the other possible activities offer the same income to agents, which means that  $a$  is the same for all possible occupations<sup>116</sup>.

Given the above, we can see that, under conditions of uncertainty, the participation constraint for the representative law-abiding agent who intends to engage into business in an economy characterized by the mafia presence is given by:

$$p \cdot (A - e - x) + (1 - p) \cdot (A - e) \geq a \quad (1)$$

where the left hand side represents the expected net gain from business activity. In fact, if the agent has to pay the “black tax” to the criminal organization (with probability  $p$ ), he/she gets  $(A - e - x)$ , which is total output minus the cost of producing that output minus the Mafia tax. If the agent does not have to pay the “black tax” (with probability  $1 - p$ ), then he/she gets  $(A - e)$ , second term in the left hand side. The right hand side of (1),  $a$ , represents instead the certain income from a regular activity, which does not imply any type of costs, as indicated before.

We have seen that, if individuals refuse to pay the “black tax” to the criminal organization they will be victims of some damage,  $d$ , and then the participation constraint for the representative agent who intends to engage into business and to do not pay the Mafia, is given by:

$$p \cdot (A - e - d) + (1 - p) \cdot (A - e) \geq a \quad (2)$$

where the left hand side represents the expected net gain from business activity when the illegal payment is not made. In fact, if the agent has to pay the “black tax” to the criminal organization (with probability  $p$ ), he/she gets  $(A - e - d)$ , which is total output minus the cost of producing that output minus the damage inflicted by the mafia when the *pizzo* is not paid. If the agent is not approached by the Mafia, he/she gets  $(A - e)$ , second term in the left hand side. As before, the

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<sup>116</sup> If we account for different values of  $a$ , meaning that different routine occupations can provide different levels of income, we will have different optimal values of extortion, as it will become clearer in the next paragraph.

right hand side of (2),  $a$ , represents instead the certain income from a regular activity, which does not imply any type of costs.

Intuitively, an entrepreneur will pay the tax imposed by the Mafia,  $x$ , only if the expected net gain from doing so is higher than the expected net gain from not doing so, in analytical terms:

$$p \cdot (A - e - x) + (1 - p) \cdot (A - e) \geq p \cdot (A - e - d) + (1 - p) \cdot (A - e) \quad (3)$$

To be more precise, according to (3), the representative agent, who has made the choice to become entrepreneur, will pay the pizzo only if the expected net gain obtained when pizzo is paid (left hand side of 3) is higher or equal to the expected net gain perceived when the illegal tax is not paid, and damage is inflicted by the criminal group as a consequence (right hand side of 3).

Simplifying, constraint (3) can be written as :  $A - e - x \geq A - e - d$ , and obviously implies that the amount of extortion must be lower or equal than the damage inflicted by the crime syndicate when the “black tax” is not paid, which is:

$$x \leq d \quad (4)$$

otherwise entrepreneurs would prefer to be subject to damage rather than pay.

The constraint expressed by (1) gives the critical value of the cost to which agents will decide to start a business, that is given by:

$$e \leq A - e - px = e^c \quad (5)$$

only individuals with an effort (cost) lower or equal to this critical value,  $e^c$ , will set up business. Since we have assumed that the population of agents is normalized to one and uniformly distributed this value  $e^c$  represents also the maximum number of businesses in the economy.

## 2.2. The Criminal Organization (the Mafia)

As it can easily be understood from the above paragraph, in the absence of corruption, the criminal organization undertakes two activities: i) it extorts money (what we have called “*black tax*” or *pizzo* or *illegal payment*) from businesses; ii) it imposes its power on entrepreneurs through the credible threat of violence, since businessmen who refuse to pay the *pizzo* are subject to damage. Notice that the idea of organized crime taking the form of extortion is not new in the theoretical literature (see e.g. : Shelling, 1984; Kugler *et al.*, 2003 and Alexeev *et al.*, 1999,2004). Notably, our formalization of the mafia reflects (almost totally) the definition of criminal organization accepted by the greater part of criminologists who describe organized crime as criminal activities for material benefit by groups that engage in: extreme violence, corruption of public officials, including law enforcement and judicial officers, penetration of the legitimate economy (e.g. through extortion and money-laundering) and interference in the political process<sup>117</sup> (Kenney and Finckenauer, 1995; Levi, 2002, cited in Van Dijk, 2007). In fact, the only aspects not represented in our model are money-laundering, corruption of judicial officers, and criminal interference in the political process. Corruption is considered later in the analysis, when we assume that law-enforcers are corruptible.

Notice that here, following the Beckerian approach, we treat the criminal group as a rational agent, however our main interest is not on the individual choice to engage in illegal activity or not<sup>118</sup>. The rational behavior of interest is that of the mafia in seeking to maximize its net expected income by choosing how much money to extort,  $x$ , and how much damage,  $d$ , to inflict, subject to the participation decision of individuals.

Before than present the problem in analytical terms, we need to introduce few new probabilities and variables. We indicate with  $q$  the Mafia’s probability to do not be detected in relation to its activity of extortion, and with  $\gamma$  the penalty to which it is subject if detected and convicted, with a

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<sup>117</sup> These elements are used as operational definitions by the European police community (Levi, 2002), and they are also incorporated in anti-Mafia laws of some countries, including Italy, USA, and Hungary (Fijnaut and Paoli, 2004).

<sup>118</sup> Though, since we assume that the mafia group exists with a probability  $p$ , and since this probability can be equal to zero (when the criminals’ probability of being detected and the severity of the penalty to which they are subject if convicted are really high), then we indirectly analyze the individual rational choice to engage in illegal activities or not, even if we do not take into account the alternative occupations for criminals.

probability  $1-q$ . Notice that we are making the strong assumption that once criminals are discovered they are inevitably prosecuted and convicted<sup>119</sup>. Moreover, as common in the literature, we assume that the punishment  $\gamma$  is proportional to the gravity of the offence, which in our case is the level of extortion  $x$ . The nature of the penalty is not relevant, it can be pecuniary or a number of years to spend in prison, or a combination of the two. What is significant for our analysis is the deterrence effect of this punishment<sup>120</sup>, the fact that it is commensurate to the magnitude of the crime and the fact that it is exogenously determined by public officials (judges at highest level)<sup>121</sup>. From this last assumption we can see that in our model the parameter  $\gamma$  reflects the effectiveness of the law system<sup>122</sup>. With regard to the Mafia's probability to do not be discovered in his illegal operations, we can easily see that it is related to the strength of the criminal syndicate in the economy, the probability  $p$  discussed in the previous paragraph. In fact, the stronger is the Mafia in the economy (i.e. the higher is  $p$ ), the higher will be his probability to avoid detection  $q$  and, clearly, the lower will be its probability to be detected and then convicted,  $1-q$ . This last probability,  $1-q$ , can be seen as a measure of the law-enforcement efficiency.

Given the above, the expected income resulting from extorting a single entrepreneur, will be equal to:

$$q \cdot x + (1 - q) \cdot (x - \gamma \cdot x) \quad (6)$$

In fact, with a probability  $q$ , the Mafia will not be detected and then will receive the full illegal payment,  $x$ . With a probability  $1-q$  the Mafia will be detected and convicted, then it will still receive  $x$  but will be also subject to a penalty  $\gamma$  proportional to the amount extorted,  $x$ .

Simplifying and multiplying by  $e^c$  (total number of businesses in the economy) and by  $p$  (measure of the strength of the Mafia in the economy) the expression above (6), we find the Mafia's expected

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<sup>119</sup> This assumption results particularly important in the model with corruption, since it implies that corruption takes place only at law-enforcement level and not at the judicial level.

<sup>120</sup>  $\gamma$  cannot be equal or smaller than zero (true??).

<sup>121</sup>  $\gamma$  can be smaller than 1, equal to 1 or higher than 1. If  $\gamma$  is smaller than 1, it means that the Mafia will still gain something even in the case it is caught. If  $\gamma$  equals to 1, the Mafia will not gain or lose anything in the case of detection, since the penalty will be exactly equal to the amount extorted. If  $\gamma$  is higher than 1, the Mafia will lose more than the amount extorted.

<sup>122</sup> In an economy in which judges and laws are strong, this parameter is high (higher or at least equal to 1).

income derived from extorting all the entrepreneurs in the economy:

$$[1 - (1 - q)\gamma] \cdot x \cdot e^c \cdot p \quad (7)$$

Furthermore, if we assume that causing damage to entrepreneurs who refuse to pay the *pizzo* is not free of charge, but implies some costs and if we assume that these costs are proportional to the amount of damage inflicted,  $\delta d$ , the total expected net income that the criminal organization wishes to maximize will be given by:

$$[1 - (1 - q)\gamma] \cdot x \cdot e^c \cdot p - \delta d \quad (8)$$

Which is expected revenues from extortion minus the total cost of inflict damage,  $\delta d$ .

As indicated earlier, we assume that the Mafia is a rational agent that seeks to maximize its net expected income by choosing how much money to extort,  $x$ , and how much damage,  $d$ , to inflict, subject to the participation decision of individuals. Analytically, the problem is then the following:

$$Max_{x,d} [1 - (1 - q)\gamma] \cdot x \cdot e^c \cdot p - \delta d \quad (8)$$

$$s.t. \quad e^c = A - a - px \quad (4)$$

$$s.t. \quad d \geq x \quad (5)$$

Notice that the two constraints (4) and (5), which represent individuals' preferences, are the two participation constraints we found in the previous paragraph.

The solution to the above maximization problem gives the optimal size of extortion and damage (respectively  $x^*$  and  $d^*$  given by equation 9) and the maximum number of individuals setting up business ( $e^c^*$  given by equation 10), when there is no corruption:

$$x^* = d^* = \frac{A - a}{2p} - \frac{\delta}{2p^2 [1 - (1 - q)\gamma]} \quad (9)$$

$$e^{c*} = \frac{A-a}{2} + \frac{\delta}{2p[1-(1-q)\gamma]} \quad (10)$$

As we can see, these optimal values are functions of important variables in the model, such as: i) the mafia's probability of being caught ( $1-q$ , which depends on the quality of the law-enforcement system); ii) the penalty inflicted to the mafia if it is actually caught ( $\gamma$ , which depends on the quality of the law and judiciary system); and iii) the shop owners' probability of being approached by the mafia ( $p$ , which depends on the extent of police protection-law enforcement system).

More specifically, from equation (9) we can see that in equilibrium the optimal level of extortion must be equal to that of damage ( $x^* = d^*$ ). From the same equation, we can also notice that when the mafia's probability of being detected ( $1 - q$ ) and the size of punishment to which criminals are subject when detected ( $\gamma$ ) increase, the optimal size of extortion ( $x^*$ ) decreases. This is because in the presence of a strong judiciary system and incorruptible police system- in analytical terms when  $(1 - q) \gamma$  is high- the mafia does not exist at all ( $p=0$ ) or if it exists, it has a really weak power (low  $p$ ) and it cannot ask for high "black taxes". This result agrees with the findings of the Beckerian literature, which has stressed the deterrence effect that an increase in the certainty and the severity of the penalty has on crime activity (e.g.:Becker, 1968; Stigler, 1970; Ehrlich, 1973; and Polinsky and Shavell 1979,2000; Witte, 1980; Grogger, 1991; Marselli and Vannini, 1997).<sup>123</sup>

Additionally, it can be seen that when private individuals' probability of being approached by the mafia ( $p$ ) increases, then the size of extortion ( $x^*$ ) increases as well. This is obvious, given the above considerations and assumptions. In fact, we have noticed that the probability ( $p$ ) can be understood as a measurement of the mafia's strength in the economy. Clearly, the higher is  $p$ , the higher is the power of the criminal organization, even in terms of "black taxes".

It can also be seen that, as we would logically expect and as confirmed by the empirical literature

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<sup>123</sup> Notice that, even if we do not analyze the individual choice between legal and illegal activity, we however find that an increase of the certainty and severity of punishment decreases Mafia's activity (extortion). The main difference between our analysis and those of Beckerian derivation, is that we are interested in the rational choice of the optimal level of the illegal activity (extortion), rather than on the rational choice of become a criminal or not.

(e.g. Peri, 2004; Kroska and Robeck 2006; Daniele and Marani, 2010), entrepreneurs perceive extortion by a criminal organization as an extra risk/cost to do business, meaning that there exists a negative relationship between the level of criminal activity and the total number of businesses in the economy. In our model, in fact, we have that the higher the level of the Mafia's activity, in terms of "black tax"  $x$  extorted to entrepreneurs, the lower the number of individuals who will decide to start a business. This can be seen in equation (10) above, according to which the total optimal number of entrepreneurs in the economy is a negative function of the probability,  $p$  (measure of the criminal organization's strength in the economy). And from equation (9) we know that the higher is this probability the higher will be the level of optimal extortion, meaning a lower number of businesses in the market.

Interestingly, when the mafia's probability of detection ( $1 - q$ ) and the severity of punishment ( $\gamma$ ) increase, the optimal level of extortion ( $x^*$ ) decreases, consequently we would intuitively expect a larger number of businesses in the economy,  $e^c *$ . And this is exactly the case, as it can be observed in equation (9). Moreover, we have underlined above that when private individuals' probability of being approached by the mafia ( $p$ ) increases- which means that the mafia's power in the economy becomes stronger- the size of extortion increases as well, then the total number of businesses in the economy decreases, as we logically would expect and as confirmed by equation (9).

### **3. The model with corruption**

#### ***3.1. Agents***

We now consider a model in which law-abiding productive agents co-exist with a criminal organization and potentially corrupt law-enforcers. As in the previous model, we assume that individuals can choose to run a business (become entrepreneurs) or to be employed in some other routine occupation. Running a business is more profitable than other regular activities; however it

exposes agents to extortion or damage by the mafia.

We again assume that law-abiding agents are risk neutral and they will pay  $x$  only if the amount of extortion is lower or at least equal than the damage  $d$  inflicted by the crime syndicate when the “black tax” is not paid:

$$x \leq d$$

The critical value of the cost to start a business is again given by:

$$e^c = A - a - x \quad (11)$$

which also represents the total number of businesses in the economy, since we assume that the population of agents is normalized to one and uniformly distributed. Note that, in this case,  $p$  (which is the probability of being approached by the mafia) is equal to 1, for assumption. Remember that this probability reflects the strength of the criminal group in the economy; assuming that it is equal to one, we are assuming that the Mafia certainly exists in the economy. This makes sense in the model in which we suppose that law-enforcers are corruptible.

### 3.2. *Law-enforcers*

Law enforcers (i.e. the police) are supposed to protect shop owners against extortion by the mafia and prosecute criminal activity. Differently from the model analyzed before, here we assume that police officers are corruptible in the sense of being potentially willing to accept bribes from the mafia in return for turning a blind eye to the mafia’s activities (i.e. extortion). Notice that, as previously, we are making the strong assumption that once criminals are discovered they are inevitably prosecuted and convicted. In an economy characterized by the presence of corruption, this assumption results to be very important, since it implies that corruption takes place only at law-enforcement level and not at the judicial level.

If we indicate with  $r$  the police’s probability of not being caught when corrupt, with  $w$  the legal income paid to the police by the government, with  $b$  the bribes which mafia is willing to pay to corrupt law enforcers, and with  $f$  the penalty imposed to corrupt policemen when detected, the

participation constraint of the representative potentially corrupt law-enforcer will be the following:

$$r \cdot (w + b) + (1 - r) \cdot (w + b - f) \geq w \quad (12)$$

The right hand side of the above represents the certain income received by the police officer when he/she is not corrupt, which is the legal income paid by the government. The left hand side, instead, represents the law-enforcer's expected payoff from being corrupt. In fact, with a probability  $r$ , he/she will not be detected and will receive the whole legal payment  $w$ , plus the illegal payment  $b$  (bribes). With a probability  $1-r$ , the police officer will be detected and convicted, then he/she will still receive the legal and illegal payments  $(w+b)$ , but will be also subject to a penalty  $f$ . This punishment might take the form of a certain amount of money to pay or a certain number of years to spend in prison, or a combination of the two. For instance,  $f$  may be equal to  $f = (w + b)$ , or to  $f = (w + b + c)$ , meaning that law-enforcers who are caught and convicted might lose both the legal income and the bribes, and they might have to pay an additional penalty  $c$ , which can be pecuniary or not (e.g. arrest), or both. As in the case of the penalty inflicted to the member of the criminal organization, we assume that the magnitude of  $f$ , which is exogenously determined, depends on the strength of the judicial and law-system in the economy<sup>124</sup>.

Clearly, according to the participation constraint expressed by (12) police officers are willing to accept bribes only if their expected payoff from doing so (left hand side) is greater or at least equal to their payoff from not doing so (right hand side). By simplifying the constraint (11), we obtain:

$$b \geq (1 - r) \cdot f \quad (13)$$

according to which the amount of bribes necessary to persuade law enforcers to be corrupt, must be higher or equal to  $(1 - r) \cdot f$ , that is the product of their probability of being caught,  $(1 - r)$ , multiplied by the penalty at which they are subject when caught,  $f$ . As we will see later, this relationship is very important in our final findings.

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<sup>124</sup> Meaning that in an economy in which judges and laws are efficiently strong, this penalty will be very high.

### 3.3. *The Criminal Organization (the Mafia)*

In the presence of corruption, the criminal organization undertakes three activities: i) it extorts money (what we have called “*black tax*”) from businesses; ii) it imposes its power on shop owners through the credible threat of violence; and iii) it chooses whether to bribe law enforcers in return for avoiding prosecution. This means that in the model with corruption, the mafia rationally seeks to maximize its income not only by choosing how much money to extort and how much damage to inflict to shop owners, but also by choosing the amount of bribes needed to persuade law-enforcers to be corrupt, subject not only to the participation decision of individuals but also to that of police officers. In the mafia’s maximization problem we have now an additional constraint – namely, the participation constraint of law-enforcement agents who are willing to accept bribes only if their expected payoff from doing so is greater than their payoff from not doing so, as seen in the previous paragraph (constraint 13).

Before than present the problem in analytical terms, we need to introduce few new probabilities and variables. We indicate with  $q'$  the Mafia’s probability to do not be detected in relation to its activity of extortion, and with  $\gamma$  the penalty to which it is subject if detected and convicted, with a probability  $1-q'$ . Notice that we are making the strong assumption that once criminals are discovered they are inevitably prosecuted and convicted<sup>125</sup>. We also assume that the Mafia’s probability of not being detected in an economy characterized by the presence of the mafia, which we have indicated with  $q'$ , is higher than the corresponding probability,  $q$ , in the model with no corruption. If law-enforcers agents are corruptible, in fact, it makes sense to assume that the criminals’ probability of avoid detection will be higher. Interestingly, the Mafia’s probability of being detected and convicted,  $1-q'$ , depends on the behavior (in terms of loyalty and conspiracy of silence) of the corrupt police officers when they are uncovered and convicted (with probability  $1-r$ ). These agents, in fact, once detected can decide to unmask the Mafia or not. Obviously, if the corrupt officials are not discovered, with probability  $r$ , the criminal organization will certainly not be

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<sup>125</sup> This assumption results particularly important in the model with corruption, since it implies that corruption takes place only at law-enforcement level and not at the judicial level.

detected as well. This means that the criminal organization can be revealed in the actuation of their illegal activities, only if the corrupt enforcement agency is detected first. This assumption will become clearer later in the paragraph, when we analyze the Mafia's expected net income.

Moreover, as common in the literature, we assume that the punishment  $y$  is proportional to the gravity of the offence, which in our case is the level of extortion  $x$ . The nature of the penalty is not relevant, it can be pecuniary or a number of years to spend in prison, or a combination of the two. What is significant for our analysis is the deterrence effect of this punishment<sup>126</sup>, the fact that it is commensurate to the magnitude of the crime and the fact that it is exogenously determined by public officials (judges at highest level)<sup>127</sup>. From this last assumption we can see that in our model the parameter  $\gamma$  reflects the effectiveness of the law system<sup>128</sup>.

Given the above, the expected income resulting from extorting a single entrepreneur, will be equal to:

$$r \cdot (x - b) + (1 - r) \cdot \{q' \cdot (x - b) + (1 - q') \cdot (x - b - \gamma \cdot x)\} \quad (14)$$

In fact, with a probability  $r$ , the law enforcers, and consequently also the Mafia, will not be detected and then the criminal syndicate will obtain the full illegal payment extorted to entrepreneurs,  $x$ , minus the cost of bribing,  $b$ . With a probability  $1-r$ , instead, the police officers will be detected, however with a probability  $q'$  he/she will not reveal the identity of the Mafia members, meaning that with a probability  $q'$  the criminal syndicate will not be detected, and then it will still collect the entire illegal payment,  $x$ , minus the cost of bribing,  $b$ . *Conversely, with a probability  $(1-q')$ , the police officers who have been detected and convicted will reveal the identity of the criminal group's components, meaning that the criminal syndicate will have to subtract to the illegal payment made by entrepreneurs,  $x$ , not only the cost of bribes,  $b$ , but also a penalty  $\gamma$  proportional to the amount*

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<sup>126</sup>  $\gamma$  cannot be equal or smaller than zero (true??).

<sup>127</sup>  $\gamma$  can be smaller than 1, equal to 1 or higher than 1. If  $\gamma$  is smaller than 1, it means that the Mafia will still gain something even in the case it is caught. If  $\gamma$  equals to 1, the Mafia will not gain or lose anything in the case of detection, since the penalty will be exactly equal to the amount extorted. If  $\gamma$  is higher than 1, the Mafia will lose more than the amount extorted.

<sup>128</sup> In an economy in which judges and laws are strong, this parameter is high (higher or at least equal to 1).

extorted,  $x$ .

Simplifying and multiplying by  $e^c$  (total number of businesses in the economy)<sup>129</sup> the expression above, we find the Mafia's expected income derived from extorting all the entrepreneurs in the economy:

$$\{[1 - (1-r)(1-q')\gamma]x - b\} \cdot e^c \quad (15)$$

Furthermore, if we assume that causing damage to entrepreneurs who refuse to pay the *pizzo* is not costless, but implies some expenses and if we assume that these costs are proportional to the amount of damage inflicted,  $\delta d$ , the total expected net income that the criminal organization wishes to maximize will be given by:

$$\{[1 - (1-r)(1-q')\gamma]x - b\} \cdot e^c - \delta \cdot d \quad (16)$$

Which is expected revenues from extortion (net of bribes paid to corrupt police officers) minus the total cost of inflict damage,  $\delta d$ .

As indicated earlier, the mafia rationally seeks to maximize its expected net income (expression 16 below) not only by choosing how much money to extort and how much damage to inflict to entrepreneurs, but also by choosing the amount of bribes needed to persuade law-enforcers to be corrupt, subject not only to the participation decision of individuals (respectively equation 11 and constraint 5 below), but also to that of police officers. It can be seen that in the mafia's maximization problem there is now an additional constraint – namely, the participation constraint of police officers who are willing to accept bribes only if their expected payoff from doing so is greater than their payoff from not doing so, as seen in the previous paragraph (constraint 13 below).

In analytical terms:

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<sup>129</sup> Remember that  $p$  is assumed to be equal to one in the model with corruption.

$$\text{Max}_{x,d,b} \{[1-(1-r)(1-q')\gamma]x-b\} \cdot e^c - \delta \cdot d \quad (16)$$

$$\text{s.t.} \quad e^c = A - a - x \quad (11)$$

$$\text{s.t.} \quad d \geq x \quad (5)$$

$$\text{s.t.} \quad b \geq (1-r) \cdot f \quad (13)$$

The solution to the new Mafia's maximization problem provides the optimal size of extortion and damage (respectively  $\mathbf{x}^{*corr}$  and  $\mathbf{d}^{*corr}$  given by equation 17), the optimal size of bribes that must be paid to persuade officials to be corrupt ( $\mathbf{b}^*$  given by equation 18), and the optimum total number of individuals setting up business in the economy ( $e^{c*corr}$  given by equation 19):

$$\mathbf{x}^{*corr} = \mathbf{d}^{*corr} = \frac{A-a}{2} + \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]} \quad (17)$$

$$\mathbf{b}^* = \mathbf{f} \cdot (\mathbf{1} + \mathbf{r}) \quad (18)$$

$$e^{c*corr} = \frac{A-a}{2} - \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]} \quad (19)$$

We can see that also in this case the optimal values of  $\mathbf{x}^{*corr}$ ,  $\mathbf{d}^{*corr}$ , and  $e^{c*corr}$  are functions of important variables in the model, such as: i) the mafia's probability of being caught ( $1 - q'$ , which depends on the quality of the police enforcement system); ii) the penalty inflicted to the mafia if it is actually caught ( $\gamma$ , which depends on the quality of the law and judiciary system); iii) the police's probability of being caught when corrupt ( $1 - r$ , which depends on the quality of the law-enforcement system); iv) the bribes ( $b$ ) that must be paid in order to persuade law enforcers to be corrupt.

More specifically, from equation (17) we can see that in equilibrium the optimal level of extortion

must be equal to that of damage ( $x^{*corr} = d^{*corr}$ ). From the same equation, we can also notice that when the mafia's probability of being detected ( $1 - q'$ ) and the size of punishment to which criminals are subject when detected ( $\gamma$ ) increase, the optimal size of extortion ( $x^*$ ) decreases. While, the total number of businesses in the economy,  $e^{c*corr}$ , increases, as shown by equation (19).

By comparing equations (9) and (17) :

$$x^* = d^* = \frac{A-a}{2p} - \frac{\delta}{2p^2[1-(1-q)\gamma]} \quad (9) \text{ Optimum level of extortion and damage}$$

*without corruption*

$$x^{*corr} = d^{*corr} = \frac{A-a}{2} + \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]} \quad (17) \text{ Optimum level of extortion and damage with}$$

*corruption*

we can see that the optimum level of extortion would be higher under corruption, since mafia needs to pay bribes to law enforcers ( $x^{*corr} > x^*$ ). Consequently, also the optimum total number of individuals who decide to set up business would be lower under corruption, as it can be seen by comparing equations (10) and (19). It is exactly in this way that the presence of both corruption and organized crime increases the costs to society by deterring more individuals from setting up business.

$$e^{c*} = \frac{A-a}{2} + \frac{\delta}{2p[1-(1-q)\gamma]} \quad (10) \text{ Optimum number of total businesses in the economy}$$

*without corruption*

$$e^{c*corr} = \frac{A-a}{2} - \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]} \quad (19) \text{ Optimum number of total businesses in the economy with}$$

*corruption*

Interestingly, from equation (18) we can see that the police's constraint is bidding in equilibrium  $b^* = f \cdot (1 + r)$ . This means that the optimal level of bribes  $b^*$  is a positive function of law enforcers' probability of being detected when corrupt,  $(1 - r)$ , and of the punishment at which they are subject when caught,  $f$ . In other words, the higher is the police's probability of being detected and the higher the penalty if they are detected, the higher the level of bribes they ask for turning a blind eye to the mafia's activities. As we can see from equation 17, the higher the level of bribes,  $b$ , the higher the level of extortion, and we know that the higher the level of extortion, the lower the number of businesses in the economy. Consequently, we can affirm that in an economy characterized by the presence of both the phenomena, corruption and organized crime, strengthening the fight against corruption (e.g., by increasing the probability of detection) could do more than good by raising police officers' demands for bribes and thereby increasing the amount of extortion even further, and therefore decreasing the number of businesses in the economy.

#### 4) Conclusions

Summarizing, we have developed a simple structure in order to explain the interdependent nature of corruption and organized crime, and their combined effect on the economy. In this framework, criminal organizations co-exist with law-abiding productive agents and potentially corrupt law enforcers. The crime syndicate obstructs the legal operations of agents through extortion, and may pay bribes to law enforcers in order to avoid detection. All the agents behave rationally, are risk neutral and take their decisions in order to maximize their profit/ payoff. In agreement with the empirical literature (e.g. Peri, 2004; Kroska and Robeck 2006; Daniele and Marani, 2010), according to which organized crime creates an unfavorable climate for business, in our model there

is a negative relationship between extortion and the number of businesses in the economy. Moreover, we find that strong policies against criminal associations, in terms of probability of detection and severity of the penalty if detected, discourage the mafia's activities (i.e. extortion), in accordance with the findings of the Beckerian literature. More remarkably, the optimal level of extortion is higher under corruption, given that the mafia needs to pay bribes to law enforcers. In this way, the presence of both corruption and organized crime increases the costs to society by deterring more individuals from setting up business.

In our analysis, in addition, we have that strong policies against law enforcers' corruption, in terms of probability of detection and severity of the penalty, increase the level of bribes asked by the same police officers to the mafia in order to turn a blind eye to their activities. As a consequence of this, if the government increases its effort on fighting corruption (e.g., by increasing the probability of detection or the severity of the penalty), the optimal size of bribes increases, determining higher extortion (since extortion is a positive function of bribes) and decreasing the total number of businesses in the economy. This means that strengthening the measures against corruption would have exactly the opposite effect than that desired (by increasing the criminal activity and deterring individuals from becoming entrepreneurs). For this reason we can conclude that, in the presence of both the phenomena, the government should evaluate alternative strategies, by concentrating on fighting organized crime rather than corruption.

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### Without corruption

$$\text{Max}_{x,d} [1 - (1 - q)\gamma] \cdot x \cdot e^c \cdot p - \delta d \quad \text{Mafia's income or utility}$$

$$\text{s.t.} \quad e^c = A - a - px$$

$$\text{s.t.} \quad d \geq x$$

$$L = [1 - (1 - q)\gamma] \cdot x \cdot [A - a - px] \cdot p - \delta d + \lambda_1 (d - x)$$

Equation 1):

$$\frac{\partial L}{\partial x} = [1 - (1 - q)\gamma] \cdot p \cdot (A - a) - 2p^2 x [1 - (1 - q)\gamma] - \lambda_1 = 0$$

Equation 2):

$$\frac{\partial L}{\partial d} = -\delta + \lambda_1 = 0 \rightarrow \lambda_1 = \delta \rightarrow \lambda_1 > 0 \rightarrow x = d$$

Substituting the value of  $\lambda = \delta$  in Equation 1):

$$\frac{\partial L}{\partial x} = [1 - (1 - q)\gamma] \cdot p \cdot (A - a) - 2p^2 x [1 - (1 - q)\gamma] - \delta = 0$$

From which we can find  $x$ :

$$x = \frac{A - a}{2p} - \frac{\delta}{2p^2 [1 - (1 - q)\gamma]}$$

Substituting the value of  $x$  in the first constraint we can find the value of  $e$ :

$$e^c = A - a - px$$

$$e^c = A - a - p \cdot \left[ \frac{A - a}{2p} - \frac{\delta}{2p^2 [1 - (1 - q)\gamma]} \right]$$

$$e^c = \frac{A-a}{2} + \frac{\delta}{2p[1-(1-q)\gamma]}$$

So we have found the optimal values of  $x$  (optimal size of extortion (“black tax”)) and  $e^c$  (maximum number of individuals who set up business) when there is a criminal group (mafia) but no corruption:

$$x = \frac{A-a}{2p} - \frac{\delta}{2p^2[1-(1-q)\gamma]} \Rightarrow \text{Optimal size of } x \text{ (extortion) when there is no corruption}$$

$\frac{\partial x}{\partial (1-q)\gamma} = -\frac{\delta}{2p^2[1-(1-q)\gamma]^2} < 0 \Rightarrow$  When the mafia’s probability of be caught and punished increases, the optimal size of extortion decreases. How can we explain this? A possible explanation is that in the presence of a strong judiciary system and incorruptible police system (in analytical terms when  $(1-q)\gamma$  is high), the mafia does not exist at all or if it exists it has a really weak power and it cannot ask for high “black taxes”. Another possible explanation is that when the probability of been caught and punished is high then, since the size of punishment is assumed to be proportional to the size of extortion, the mafia keeps “black taxes” low.

$\frac{\partial x}{\partial \delta} = -\frac{1}{2p^2[1-(1-q)\gamma]} < 0 \Rightarrow$  When mafia’s cost of inflict damage to private individuals increases, the optimal size of extortion decreases (how can we explain this?)

$\frac{\partial x}{\partial p} = \frac{\delta}{p^3[1-(1-q)\gamma]} - \frac{A-a}{2p^2} > 0 \Rightarrow$  When private individuals’ probability of been approached by the mafia increases, then the size of extortion increases as well.

$$e^c = \frac{A-a}{2} + \frac{\delta}{2p[1-(1-q)\gamma]} \Rightarrow \text{Maximum number of individuals who set up business when there is no corruption}$$

$\frac{\partial e^c}{\partial \delta} = + \frac{1}{2p[1-(1-q)\gamma]} > 0 \Rightarrow$  When mafia's cost of inflict damage to private individuals increases, then the number of individuals who decide to set up a business increases.

$\frac{\partial e^c}{\partial (1-q)\gamma} = + \frac{\delta}{2p[1-(1-q)\gamma]^2} > 0 \Rightarrow$  When mafia's probability of being caught increases, the number of individuals who decide to set up a business increases, as we logically would expect.

$\frac{\partial e^c}{\partial p} = - \frac{\delta}{2p^2[1-(1-q)\gamma]} < 0 \Rightarrow$  When private individuals' probability of been approached by the mafia increases, the number of individuals who decide to set up business decreases, as we logically would expect.

### With corruption

$$\text{Max}_{x,d,b} \{ [1-(1-r)(1-q')\gamma]x-b \} \cdot e^c - \delta \cdot d$$

$$\text{s.t.} \quad e^c = A - a - x \quad p=1$$

$$\text{s.t.} \quad d \geq x$$

$$\text{s.t.} \quad b \geq (1-r) \cdot f$$

$$L = \{ [1-(1-r)(1-q')\gamma]x-b \} \cdot [A-a-x] - \delta d + \lambda_1(d-x) + \lambda_2[b-(1-r) \cdot f]$$

$$\frac{\partial L}{\partial d} = -\delta + \lambda_1 = 0 \rightarrow \lambda_1 = \delta \rightarrow \lambda_1 > 0 \rightarrow x = d$$

$$\frac{\partial L}{\partial b} = -(A-a-x) + \lambda_2 = 0 \rightarrow \lambda_2 = A-a-x \rightarrow \lambda_2 > 0 \Rightarrow b = (1-r) \cdot f$$

$$\frac{\partial L}{\partial x} = [1-(1-r)(1-q')\gamma](A-a) - 2x \cdot [1-(1-r)(1-q')\gamma] + b - \lambda_1 = 0$$

Since  $\lambda_1 = \delta$  we have:

$$\frac{\partial L}{\partial x} = [1-(1-r)(1-q')\gamma](A-a) - 2x \cdot [1-(1-r)(1-q')\gamma] + b - \delta = 0$$

From which we can get the optimal size of “black tax”  $x$  when there is corruption:

$$x^{corrupt} = \frac{A-a}{2} + \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]}$$

Notice that the optimal size of  $x$  is higher when there is corruption than when there is no corruption; in fact,  $x$  without corruption has been found to be equal to:

$$x = \frac{A-a}{2p} - \frac{\delta}{2p^2[1-(1-q)\gamma]}$$

$$x^{corrupt} = \frac{A-a}{2} + \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]} > x = \frac{A-a}{2p} - \frac{\delta}{2p^2[1-(1-q)\gamma]}$$

The amount of extortion would be higher under corruption since the mafia needs to pay bribes to law enforcers. Consequently, the total number of individuals who decide to set up business would be lower under corruption.

In fact, substituting the value of  $x^{corrupt}$  in the first constraint we can get the value of  $e^c_{corr}$  (the maximum number of individuals who set up business) in the presence of corruption:

$$e^c_{corr} = \frac{A-a}{2} - \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]}$$

Notice that the number of individuals who decide to set up business when there is corruption is lower than that when there is no corruption, which has been found to be equal to:

$$e^c = \frac{A-a}{2} + \frac{\delta}{2p[1-(1-q)\gamma]}$$

$$e^c_{corr} = \frac{A-a}{2} - \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]} < e^c = \frac{A-a}{2} + \frac{\delta}{2p[1-(1-q)\gamma]}$$

**Important relationships if there is an Organized Criminal group and Police Corruption**

$$x^{corrupt} = \frac{A-a}{2} + \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]} \Rightarrow \text{Optimal size of } x \text{ (extortion) when there is corruption}$$

$\frac{\partial x^{corr}}{\partial b} = + \frac{1}{2[1-(1-r)(1-q')\gamma]} > 0 \Rightarrow$  When bribes that mafia needs to pay to the police in order to avoid detection increase, the optimal level of extortion increases as well.

$\frac{\partial x^{corr}}{\partial \delta} = - \frac{1}{2[1-(1-r)(1-q')\gamma]} < 0 \Rightarrow$  When mafia's cost of inflict damage to private individuals increases, then the optimal level of extortion decreases.

$\frac{\partial x^{corr}}{\partial(1-r)(1-q')\gamma} = + \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]^2} > 0 \Rightarrow$  When police and mafia's probability of being caught increases, and when the penalty inflicted to mafia if caught increases, then the level of extortion increases as well.

$$e_{corr}^c = \frac{A-a}{2} - \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]} \Rightarrow \text{Maximum number of individuals who set up business when there is corruption}$$

$\frac{\partial e_{corr}^c}{\partial \delta} = + \frac{1}{2[1-(1-r)(1-q')\gamma]} > 0 \Rightarrow$  When mafia's cost of inflict damage to private individuals increases, then the number of individuals who decide to set up a business increases (since the optimal level of extortion has decreased).

$\frac{\partial e_{corr}^c}{\partial b} = - \frac{1}{2[1-(1-r)(1-q')\gamma]} < 0 \Rightarrow$  When bribes that mafia needs to pay to the police in order to avoid detection increases, the number of individuals who decide to set up a business decreases (In fact, an increase in bribes means an increase of the amount extorted, which prevents individuals from setting up business).

$\frac{\partial e_{corr}^c}{\partial(1-r)(1-q')\gamma} = - \frac{b-\delta}{2[1-(1-r)(1-q')\gamma]^2} < 0 \Rightarrow$  When police and mafia's probability of being caught increases, and when the penalty inflicted to mafia if caught increases, then the number of individuals who decide to set up business decreases, as the level of extortion has increased.

## CHAPTER 3

# CORRUPTION AND ORGANIZED CRIME: GROWTH IMPLICATIONS FOR ITALY

Kyriakos C. Neanidis

Economics and CGBCR, University of Manchester

Maria Paola Rana

Economics and CGBCR, University of Manchester

### **Abstract**

This paper examines the impact of corruption on economic growth in the presence of organized criminal activities. Using a panel of 19 Italian regions for the period 1983-2009, the analysis reveals (i) a growth-inhibiting effect of both corruption and organized crime, and (ii) that in the presence of organized crime the growth-inhibiting effect of corruption is less severe. This finding offers support to the argument that with organized corruption arrangements and better coordination in the bureaucrat's rent-seeking behavior, corruption is less distorting for economic growth. The results are robust to different specifications, measures of organized crime, and estimation methods.

### **1. Introduction**

Almost everybody is aware of the fact that criminal organizations typically involve collusion or direct participation of the public sector. In 1994, the United Nation's Naples Declaration officially recognized that Organized Crime (OC) has a "corrupting influence on fundamental social, economic, and political institutions", and that OC uses "violence, intimidation and corruption to earn profit or control territories or markets". More recently, a survey conducted by the Eurobarometer (2006), based on public perceptions of the links between corruption and OC, revealed that more than half of European citizens (54%) believe that most corruption in their countries is related to organized crime. It is not difficult, in fact, to realize that criminal systems

strongly depend on corruption in order to carry out their activities and to reduce the risk of detection and prosecution. There exist a number of studies focused on the links between corruption and OC, however most of them analyze the phenomena from a sociological point of view (e.g.: Shaw, 2002; Mazzitelli, 2007; Sergi and Querimi, 2007), or from a theoretical microeconomic point of view (e.g.: Becker and Stigler, 1974; Bowles and Garoupa, 1997; Chang *et al.*, 2000; Kugler *et al.*, 2003). To the best of our knowledge, there are not empirical analyses of the two phenomena jointly considered in the context of a growth regression. The study we present in this paper intends to fill this gap and to underline the importance of considering the two illegal phenomena at the same time. In the following paragraphs we review the existing literature which has analyzed the effects of corruption and organized crime, separately considered, on economic growth.

Since the middle 1990s, a large body of literature has shown that corruption has significant adverse effects on economic growth (e.g. Gyimah-Brempong, 2002; Keefer and Knack, 1997; Knack and Keefer, 1995; Li *et al.*, 2000; Mauro, 1995; Mo, 2001; Sachs and Warner, 1997)<sup>130</sup>. These and other investigations have also indicated a variety of ways in which corruption may affect growth, such as lowering investment rates (e.g., Mauro, 1995), reducing the flood of inward foreign direct investments (e.g. Wei, 2000; Pellegrini and Gerlagh, 2004), decreasing the effectiveness of foreign aid flows (IMF, 1995; World Bank, 1998) and determining misallocations of government expenditure (e.g., Mauro, 1998; Tanzi and Davoodi, 1997; Gupta *et al.*, 2001). Besides, it has been shown that: corruption might determine a misallocation of talent and skills away from productive activities towards rent-seeking activities (see for e.g. Acemoglu, 1995; Ehrlich and Lui, 1999; Murphy *et al.*, 1991); corruption may weaken the protection of property rights, create obstacles to doing business and obstruct technological progress and transfer (see North, 1990; Hall and Jones, 1999; World Bank, 2002); corruption might cause firms to expand slower, to implement inefficient

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<sup>130</sup> We refer to the most common definition of public sector corruption, which describes the phenomenon as the abuse of public office for personal gain. See Aidt (2003), Bardhan (1997) and Jain (2001) for some surveys on corruption literature.

technologies and to move their activities to the informal sector (see Sarte, 2000; Svensson, 2005); corruption may lead to costly concealment and detection of illegal income, resulting in a deadweight loss of resources (see Blackburn *et al.*, 2006; Balckburn and Forgues Puccio, 2007); corruption may increase the government's reliance on seignorage finance (Blackburn *et al.*, 2008).<sup>131</sup>

However, it must be recognized that the phenomenon seems to have different effects on different countries. In fact, some countries such as Vietnam, Indonesia, Thailand, and especially China have attracted very high floods of FDI and achieved very high growth rates in per capita income over relatively long time periods, in spite of rather high levels of corruption<sup>132</sup>. An early branch of the literature has tried to explain the beneficial effects of corruption with the so-called “speed money” hypothesis, according to which the phenomenon can be positive to growth by helping to circumvent regulations in the bureaucratic process (e.g. Huntington, 1968; Leff, 1964; Lui, 1985). Shleifer and Vishny (1993), instead, have emphasized the importance of the extent to which public officials are organized in their extraction of bribes, since this may have an important influence on the consequences of bribes. The idea is that if bureaucrats are organized and act as a joint monopoly rather than independent monopolists in the collection of bribes, then they will try to maximize their total income, rather than the individual one, and will internalize any externalities. More recently, Blackburn and Forgues-Puccio (2009) followed this approach in the contest of a dynamic general equilibrium model in which growth occurs endogenously through the invention and manufacture of new intermediate goods that serve as inputs in the production of final output. Inventive activity (research and development) is undertaken by entrepreneurs who require various licenses from

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<sup>131</sup> Among the few empirical studies that have analyzed the effects of corruption on the economic growth of the Italian regions, Del Monte and Papagni (2001) have shown that effectively corruption has a negative impact on the productivity of public investment, and that this effect is distinct from a direct negative one on the growth rate.

<sup>132</sup> Since the most prominent examples of countries with high-corruption and high-growth rates are to be found in South-East Asia, the anomaly has been called “East Asian” paradox. The term was introduced for the first time by Wedeman (2002), but also studied by Wei (1997) and Campos *et al.* (1999).

public officials in order to embark on this activity. All bureaucrats are corrupt and each one of them exploits his monopoly over the issue of a license by demanding a bribe in exchange for it. The authors studied the implications of this when bureaucrats act either individualistically (disorganized corruption) or collectively (organized corruption). Given this, the study shows that bribe payments are lower, innovation activity is higher and growth is higher when corrupted behavior is organized than when it is disorganized. In this way the analysis shed light on the issue of why the effects of corruption on growth appear to be so different across countries.

The argument just discussed seems to explain the experience of the large newly East Asian industrialized economies better than the so called “speed-money” theory. In fact, for these countries it has been empirically found that corruption reduces investment by less and that the correlation between corruption and investment is positive (e.g. Campos et al., 1999; Rock and Bonnet, 2004), and effectively they are all characterized by centralized (organized) corruption networks. Interestingly, such networks are also a feature of some developed economies that have relatively high corruption ratings, such as Italy. An important aspect, often ignored by the literature on corruption, is that Italy is also characterized by the presence of organized crime (OC).

The channels through which the phenomenon of criminal organization affects economic growth have been widely studied. For the case of Italy, it has been found that OC: i) has a negative impact on factor productivity, especially labor productivity (i.e.: Felli and Tria, 2000 and Centorrino and Ofria, 2008) ii) inhibits the accumulation of human capital both directly (reducing the incentive to invest in formal education) and indirectly by increasing migration outflows (Coniglio *et al.*, 2010) iii) increases public investment whereas reduces that from the private sector (Caruso, 2008) iv) raises the total amount of public funding (Barone and Narciso, 2011) v) is a deterrent for foreign investors (Daniele and Marani, 2010) vi) increases the cost of local public services, especially

those of collection and disposal of waste material (Ciaccio, 2009) viii) reduces the access to credit by increasing the cost of loans and the amount of collaterals required by the banks (Bonaccorsi di Patti, 2009). Daniele and Marani (2010), for example, have examined the effect of OC on FDI inflows, using data for 103 Italian provinces for the period 2002-2006. OC is proxied by the sum of official data on four different crimes that are traditionally related to the presence of criminal organization of the mafia-type (i.e.: criminal association, mafia-criminal association, extortion, bomb attacks and arsons). The authors found that a higher presence of mafia-type crimes significantly reduces foreign investment inflows. The existence of OC, in fact, not only increases the risks and the costs of business, but can also be perceived as a signal of a socio-institutional system unfavorable for business activities. The result is still valid even after controlling for financial incentives granted to firms that invest in the less-developed areas, suggesting that criminal organizations tend to reduce the effectiveness of development policies. Bonaccorsi di Patti (2009), instead, analyzed the relationship between the terms on bank loans and local crime rates, employing a sample of over 300,000 bank-firm relationships in Italy. The results showed that where the crime rate is higher, access to credit is more difficult and borrowers pay higher interest rates and pledge more collaterals. The author stressed the fact that the offences which influence the loan market are those that exogenously increase firm fragility, such as extortion and OC. More recently, Barone and Narciso (2011) have provided evidence that the presence of mafia affects the allocation of public transfers in the sense that firms located in municipalities with mafia activity receive larger public funds (mafia averted around 35% of the total amount of public transfers on average over the period 2004-2009)<sup>133</sup>. Also in this analysis, OC presence is measured by the number of cases provided by Art.416-bis of the Italian Penal Code.

Peri (2004), instead, has analyzed the effects of social variables on long-run provincial economic

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<sup>133</sup> As a measure of public transfers/funds, the authors have used the Law 488/92 data set provided by the Italian Ministry of Industry, which regulates the issuance of project-related capital grants. This Law 488/92 has been used as the main policy instrument for reducing territorial disparities in Italy, by offering subsidies to firms willing to invest in less developed areas.

performance during Italy's era of economic take-off (1951-1991). The author found strong evidence that the presence of OC (proxied by murder rates at the beginning of the period) is associated with low economic development, even after controlling for other economic and geographic factors<sup>134</sup>. More recently, Pinotti (2011), has examined the post-war economic growth of two Italian regions in southern Italy (Basilicata and Puglia) exposed to mafia activity after the 1970s and has applied synthetic control methods to estimate their counterfactual economic performance in the absence of organized crime. OC is measured by the number of cases provided by Art.416-bis of the Italian Penal Code (mafia-type criminal organization) reported by the police to the judiciary authority. The author uses also the murder rate as an alternative indicator for the presence of criminal organizations, in order to measure the evolution of OC across regions for the period before 1983, when Art. 416-bis had not been introduced yet. The comparison of actual and counterfactual development showed that the presence of mafia lowers GDP per capita by about 16%<sup>135</sup>.

As we can see, the literature on the effects of OC on economic growth at a cross-regional level for the case of Italy is vast; however this is not the case at a cross-country level because of the limited availability of reliable data.<sup>136</sup> Moreover, an interesting aspect that has been almost ignored by the existing literature concerns the link between corruption and OC and their joint effect on growth.

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<sup>134</sup> Peri (2004) mostly uses employment rates and employment growth as indices of economic activity. To validate the use of employment rates as a measure of economic activity, the author refers to several models that imply a positive relationship, in equilibrium, between employment rates and productivity. He also calculates the correlation between employment rates and value added per capita across Italian provinces for the period (1971-1991), finding that this correlation is positive and very high. Regarding the use of murder rates to proxy for the presence of OC, the same author acknowledges that "...murder rates are interpreted as an imperfect index capturing the presence of powerful criminal organizations".

<sup>135</sup> Historical series of electricity consumption suggest that lower GDP reflects a net loss of economic activity, rather than a mere reallocation from the official to the unofficial sector. Electricity consumption, in fact, is often used to estimate the size of the black/shadow economy, since it depends on the demand by both the official and the unofficial sector (see also, e.g., Johnson *et al.*, 1997 and Del Bocca and Forte, 1982).

<sup>136</sup> One of the few cross-country analyses of the effects of organized crime on growth is presented by Kroska and Robeck (2006). The authors examined the impact of criminal organizations on the enterprise sector, using a panel data of 34 countries in Europe and Asia for the period 2002-05. The main result is that OC is associated with weak development of micro enterprises in the service sector, operating in large countries with high unemployment rates. The paper also underlined that the presence of OC represents a disincentive for FDI inflows and job creation, particularly in less advanced transition countries.

There exist a number of studies focused on the links between corruption and OC, however most of them analyze the phenomena from a sociological point of view (e.g.: Shaw, 2002; Mazzitelli, 2007; Sergi and Querimi, 2007), or from a theoretical microeconomic point of view (e.g.: Becker and Stigler, 1974; Bowles and Garoupa, 1997; Chang *et al.*, 2000; Kugler *et al.*, 2003). The microeconomic literature on crime has started to consider the problem of bribed officials since the preliminary work of Becker and Stigler (1974). The authors first recognized that the effectiveness of the enforcement system is reduced if the amount of bribes paid by the criminal to corrupted public enforcers is considerably less than the monetary equivalent of punishment to which the criminal would incur if convicted. Clearly this means that bribes reduce punishment and therefore deterrence. Following this result the authors suggested to improve the quality of enforcement by raising the salaries of public officials or by paying private enforcers for performance.<sup>137</sup> Some sociological studies (e.g.: Shaw, 2002), instead, have underlined that the weakening and criminalization of the State is often a component of organized crime, with government actors also involved in criminal activities, as in the case of some African countries like Nigeria, Liberia and Ghana. More recently, Mazzitelli (2007) has explored the different factors that contribute to criminal activities in West Africa, emphasizing that the region is an ideal place for structured criminal networks since risks are reduced as a result of poor governance, i.e.: weak state institutions, weak rule of law and enforcement agencies, which are common institutional determinants of corruption as well. Sergio and Querimi (2007) studied the relationship between corruption and socio-economic development and between organized crime and socio-economic development in the context of South-East Europe. The authors noted that both corruption and organized crime are prevalent in the region, stressing that the key problem is a weak role of law (i.e. inefficient judicial systems and weak enforcement control). More interestingly with respect to our study, Buscaglia and Van Dijk (2003) carried out a statistical analysis of a large sample of countries,

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<sup>137</sup> Becker and Stigler (1974) suggested to increase the salaries of enforcers above what they could get elsewhere, by an amount that is inversely related to the probability of detection, and directly related to the size of bribes and other benefits from malfeasance.

founding that high levels of corruption and OC are consistently linked to low levels of human development.<sup>138</sup> A further study by Van Dijk (2007) corroborated the interrelations between organized crime, law enforcement, rule of law and economic development: when OC is prevalent, law making tend to serve the interests of few instead of the general interest, undermining market efficiency and public reliance in the legal and regulatory functions of the State.<sup>139</sup>

It can be seen that the literature focused on the relations between corruption and organized crime is not vast, and this is especially true with regard to the macroeconomic literature, which is practically inexistent. Very recently also Transparency International has stressed the importance of better understanding the links between the two phenomena as a way of combating corruption (Holmes, 2010). The contribution we present here moves in this direction, by jointly considering the two phenomena in an empirical investigation that focuses on the growth of Italian regions over the period 1983-2009. The choice of carrying out our analysis at a cross-regional level for the case of Italy and not at a cross-country level is mainly related to the availability of data on crimes ascribable to organized criminal groups. The Italian National Institute of Statistics (ISTAT), in fact, offers a variety of data on mafia-related crimes which are available for a rather long period; this has allowed us to construct accurate indexes and to carry out our investigation for an adequate length of time. Given the lack of appropriate and reliable data on organized crime at an international level, such an analysis would have not been possible at a cross-country level. The main aim of our analysis is to empirically examine the effects of corruption and organized crime (OC) on economic growth, and to test if the presence of organized crime influences the impact of corruption. As largely discussed above, there is no doubt that there exists a link between the two phenomena, and it

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<sup>138</sup> The authors constructed a composite index of OC which includes indicators of five core activities of OC (trafficking in persons, arms, stolen vehicles, cigarettes and fraud) and four secondary factors (costs for businesses, extent of the informal economy as a proportion of GDP, violence and money laundering). The study also finds that critical determinants organized crime are the quality, independence and integrity of law institutions.

<sup>139</sup> The author constructed a composite index of OC combining data on the perceived presence of OC, unsolved homicides, grand corruption, money laundering and the extent of the black economy. Data are taken from the World Economic Forum annual survey (Global Competitiveness Report), official crime statistics, and World Bank governance indicators.

is reasonable to believe that in the presence of OC also corruption among bureaucrats may be organized. More specifically, we start from the hypothesis that criminal groups may play a significant role in organizing corruption. Therefore, in our study we interact the measures of corruption and OC in order to actually test for the effect of organized corruption on economic growth. Confirming past studies, our findings show that corruption and OC have both a growth-inhibiting effect, but also that in the presence of OC the negative impact of corruption on growth is smaller in magnitude. The latter result seems to support the argument that when corruption operates within an organized environment it is less distorting for growth (Blackburn and Forgues-Puccio, 2009). Consequently, our analysis suggests to further investigate the two phenomena from a theoretical point of view. The model presented by the two authors cited above, in fact, compares organized corruption versus disorganized corruption, but it does not account for OC. It may be the case that the organization among bureaucrats in the presence of OC leads to an even lower level of bribes. It is important to emphasize that we are not giving a prescription for organized crime, but we are trying to give an explanation to the fact that corruption seems to have a less harmful effect in Italy rather than in other countries. Then, the suggestion for policy makers when deciding new anti-corruption policies is that to better understand the nature of the phenomenon of corruption and to do not ignore the possible links with other illegal phenomena present in the economy.

The remainder of the paper is structured as follows. Section 2 presents the estimation strategy and the methodology employed in our empirical analysis. Section 3 describes the data set in use. Section 4 reports the benchmark results, whereas Section 5 tests the baseline findings using different specifications and measures of organized crime. Section 6 concludes the paper with a summary and some final comments.

## **2. Estimation Strategy and Methodology**

The main aim of our investigation is to empirically analyse the effects of corruption and organized

crime (OC) on economic growth, and to test if and how the presence of organized crime influences the impact of corruption.

In order to do so, we first estimate the effect of corruption on the growth rate of GDP per capita by also checking if this effect differs for regions with a higher presence of organized crime (this is done by interacting the measure of corruption with a dummy variable for regions with high OC). The regions have been chosen on the base of data on Mafia criminal association (as defined by art. 416 bis of the Italian penal code) for the period 1983-2009.<sup>140</sup> The regions with the highest rates of this kind of crime are: Sicily, Calabria, Campania, Puglia, Basilicata, Molise, Lazio, and Liguria (as it can be seen also in the map presented by Pinotti, 2011). To conduct our preliminary estimations, we use the following specification:

$$g_{i,t} = \alpha + \beta_1 Corr_{i,t} + \beta_2 (Corr * HighOC)_{i,t} + \sum_{j=1}^m \gamma_j X_{j,it} + \mu_i + \varepsilon_{i,t} \quad [1]$$

where the dependent variable  $g_{i,t}$  is the growth rate of per capita real GDP of region  $i$  in period  $t$ ;  $\{X_{j,it}\}$  represents a set of explanatory variables typically included in growth regressions (e.g. Barro, 1991; Levine and Renelt, 1992; Sachs and Warner, 1995);  $Corr_{i,t}$  is a measure of corruption;  $HighOC_{i,t}$  is a dummy variable for the regions where the presence of OC is more widespread;  $Corr_{i,t} * HighOC_{i,t}$  is the interaction term between corruption and the dummy variable just discussed;  $\mu_i$  captures unobserved time-invariant region-specific effects; and  $\varepsilon_{i,t}$  is the time-varying error term.

The set  $\{X_{j,it}\}$  includes a baseline group of control variables comprising the log of initial real GDP per capita, the ratio of investment to GDP, the rate of inflation as measured by the GDP deflator, and the secondary school enrolment rates. In addition to these baseline variables, extended group of controls includes the rate of population growth, the ratio of trade to GDP, and share of total

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<sup>140</sup> See Figure 4 in Appendix for more details on the renking of the Italain regions for the Mafia criminal association rate and other Mafia-related crimes.

public spending to GDP.

Differently from the existing literature at a cross-country level, which relies on perception indexes of the phenomenon, our measure of corruption is the official number of crimes against public administration per 100,000 inhabitants reported to the police and published by the Italian National Institute of Statistics (ISTAT).<sup>141</sup> The crimes against public administration that we consider are based on Statutes no.286 through 294, which include crimes of peculation and embezzlement. Other crimes against public administration, such as insulting a public officer (Statute 279) and neglect or refusal of an official duty (Statute 295), are excluded. This measure has already been used by Del Monte and Papagni (2001, 2007) in empirical analysis for the case of Italy.<sup>142</sup> Since the index is not a measure of actual corruption crimes, but only of the crimes reported to the police, it might underestimate the phenomenon. Moreover, as pointed out by the authors, it could also be affected by a systematic bias due to differences among regions in reporting crimes<sup>143</sup>. However, by regressing the statistics on reported crimes of corruption and an index of the length of the judicial processes, Del Monte and Papagni (2007) found that we should not expect large systematic differences among regions in the proportion of reported and detected crimes to actual ones.<sup>144</sup>

When estimating equation (1) we expect a growth-inhibiting effect of corruption, as usually found

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<sup>141</sup> Official data on crimes against public administration are published by ISTAT since 1961 (ISTAT-Annals of Judicial Statistics). The most common measures of perceived corruption used in empirical cross-country analyses are: the Corruption Perception Index (CPI published by Transparency International); the International Country Risk Guide index (ICRG); the index calculated by Kaufmann *et al.* (2006); the measure given by Dreher *et al.* (2007).

<sup>142</sup> We thank Erasmo Papagni for kindly sharing the data for the years 1961-2001. Data from 2002-2005 can be found in the online ISTAT website. For the most recent data on corruption (2005-2009), we thank ISTAT officers for the collection and transmission of the data.

<sup>143</sup> In fact, it is reasonable to expect that the probability of being caught and charged is lower in regions where the judicial efficiency is worse. This may determine a lack of trust in the police and judges and discourage people in reporting crimes. Additionally, the lower probability to be detected could increase the number of corruption crimes in regions where judicial efficiency is lower.

<sup>144</sup> The authors discussed two additional criticisms that might arise regarding the index of corruption we use. First, due to the fact that many crimes are reported in a year different from the year when they were actually committed, the legal circumstances may have changed over time. However, this does not apply for the case of Italy, as the law on corruption is not changed since 1961, apart from changes in penalties after 1993. The other criticism refers to the fact that an increase in the number of reported and detected crimes may reflect an increase in the willingness to report crimes or an improvement in the efficiency of the police rather than an increase in the actual number of crimes. Del Monte and Papagni (2007), however, compare the dynamics of the index of corruption based on official data against the CPI (Corruption Perception Index by Transparency International) for the last two decades, showing that the two indexes have similar trends and are highly and positively correlated. As argued by the authors, this suggests that the index based on official data actually captures the phenomenon of corruption.

in the existing literature. Additionally, given our main thesis according to which organized corruption is less harmful than disorganized corruption, we expect the coefficient on the interaction term,  $\beta_2$ , to be positive and significant, meaning that the negative effect of corruption on the rate of GDP pc growth is mitigated in regions where there is a high presence of OC.

To better understand these preliminary findings, and to consider whether OC exhibits an independent effect on growth, we consider the following specification:

$$g_{i,t} = \alpha + \delta_1 Corr_{i,t} + \delta_2 OC_{i,t} + \delta_3 (Corr * OC)_{i,t} + \sum_{j=1}^m \gamma_j X_{j,it} + \mu_i + \varepsilon_{i,t} \quad [2]$$

where compared to equation (1) we drop the *Corr\*HighOC* interaction term, we include a measure of organized crime ( $OC_{i,t}$ ), and an interaction term between corruption and organized crime ( $Corr*OC_{i,t}$ ). In this way we are able to study the effect of the two phenomena independently of each other but also jointly through their interaction.

If our thesis continues to hold, the coefficients on corruption and organized crime ( $\delta_1$  and  $\delta_2$ , respectively) are expected to be negative and statistically significant. The term  $Corr*OC_{i,t}$  is the key element in our regression, being used to capture the effect of corruption on economic growth in the presence of organized crime. If the negative effect of corruption on the rate of GDP pc growth is reduced in regions where there is a high presence of OC, then the coefficient on the interaction term,  $\delta_3$ , should come out positive and statistically significant. Given that by interacting the measures of the two phenomena we are empirically testing for the impact of organized corruption, our findings would actually prove that organized corruption is less distorting than disorganized corruption.

Let us now turn to discuss the main measure of organized crime we use and the methodology we employ in order to estimate equations (1) and (2).

Following the existing literature (Daniele, 2009; Daniele and Marani, 2010; Pinotti, 2011: and Caruso, 2008), we construct different indexes of organized crime by considering different

combinations of “mafia-related” crimes, and using them alternatively through the analysis. Our preferred measure of organized crime, however, is an index built as the sum of official data on five different crimes that by definition reflect the presence of criminal organizations, or that are indicative of the presence of criminal organizations.<sup>145</sup> The five crimes we consider are: i) criminal association (art. 416 Italian Penal Code) ii) Mafia criminal association (art. 416 bis Italian Penal Code)<sup>146</sup>; iii) homicides by Mafia; iv) extortion and v) bomb attacks.<sup>147</sup>

Since 1982, the Italian judicial system makes a clear distinction between criminal association (art. 416) and criminal association of Mafia-type (art. 416 bis).<sup>148</sup> Common criminal association is defined as “*the association of three or more people who are organized in order to commit a plurality of crimes*”. The characteristics of this kind of offence are the following: i) the stability of the agreement among the components, i.e. the existence of an associative connection intended to be continuous through time even after once the crimes have been committed and ii) the existence of a programme of delinquency to commit an indeterminate number of crimes.<sup>149</sup> On the other hand, an association is defined of the Mafia-type “*when its components use intimidation, awe and silence (omertà) in order to commit crimes, to acquire the control or the management of business activities (i.e.: concessions, permissions, public contracts or other public services), to derive profit or advantages for themselves or others, to limit the freedom of exerting the right to vote, and to find*

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<sup>145</sup> In fact, even if it is not always possible to distinguish crimes committed by the Mafia or other criminal organizations (Camorra, N'drangheta, Sacra Corona Unita) from those committed by other criminals, it is however possible to recognize that some offences are not typically committed by organized groups of the Mafia-type, such as, for example, crimes of fraud, theft and sexual violence, as underlined by Daniele and Marani (2010) and La Spina and Lo Forte (2006).

<sup>146</sup> The term Mafia is used to include all the main criminal organizations that are present in the different Italian regions, such as Cosa Nostra in Sicily, Camorra in Campania, ‘ndrangheta in Calabria, and Sacra Corona Unita in Puglia. This measure of OC has already been used by Pinotti (2011).

<sup>147</sup> For all the crimes we use rates for 100,000 inhabitants reported by the police to the judicial authority. These data are available from the Annals of Judicial Statistics published by ISTAT.

<sup>148</sup> Until 1982, Article 416 of the Italian Penal Code (“*associazione a delinquere*”) punished in the same way all the groups of three or more people involved in some type of criminal activity. This generic term could not distinguish between small groups of bank-robbers and larger criminal networks with a powerful control over the territory. This changed in 1982 with the introduction of the crime: “*associazione a delinquere di stampo mafioso*” provided by Article 416 -bis( Law 646/82).

<sup>149</sup> This definition is similar to that given by the UN Convention against Transnational Organized Crime (2004) which describes organized crime as a “*...structured group of three or more persons existing for a period of time and acting in concert with the aim of committing one or more serious crimes or offences [...] in order to obtain, directly or indirectly, a financial or other material benefit*”.

*votes for themselves or others during the electoral campaign”*.<sup>150</sup>

In general all judicial-based measures of crime are subject to under-reporting, as underlined by MacDonald (2002). This may be especially true for mafia-related crimes, as intimidation and silence (*omertà*) affect judicial investigations particularly in regions where criminal organizations are more influential. At the same time, however, under-reporting is smaller for crimes like homicides (Fajnzylber *et al.*, 2002 and Soares, 2004). This is why we include in our baseline index the number of homicides attributable to Cosa Nostra, Camorra, ‘Ndrangheta and Sacra Corona Unita.

Another usual crime of the Mafia-type organizations, which we incorporate in our baseline measure of OC, is extortion. “The *pizzo*<sup>151</sup> is confirmed to be the typical offence of criminal organizations, being used to financially maintain the criminals’ families, the clans, to ensure wages to co-operators, to support prisoners, and to pay the lawyers. The *pizzo* ensures the everyday activity of criminal organizations, it increases its domain, it confers more prestige to the clans, and measures the rate of silence (*omertà*) in a given area, headquarter, or community” (Confesercenti, 2009: 14).<sup>152</sup> In fact, it has been largely documented by the existing literature that almost all the Mafia families exercise their power over a territory through the racket of extortion.<sup>153</sup> Also in this case, however, official data often underestimate the phenomenon, since the crimes formally reported to the police are less than those actually committed. This has been regularly pointed out by Confesercenti, according to which in 2009 a total of 160,000 commercial activities mainly based in Sicily, Campania, Puglia and Calabria have been subject to extortion, with total revenues estimated

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<sup>150</sup> The last two typical activities of the Mafia-type criminal organizations have been introduced by the Italian penal code only in 1992, in the framework of the measures adopted after the Capaci and Via D’Amelio’s massacres (where the judges Giovanni Falcone and Paolo Borsellino were killed). Besides, art. 416 bis provides the confiscation of mafia’s properties, and the application of this law also in the hypothesis of camorra, ‘ndrangheta or other associations ascribable to those of mafia-type, that are in any case locally denominated.

<sup>151</sup> “*Pizzo*” is the Italian word to indicate the “black tax” imposed by the Mafias to entrepreneurs subject to extortion.

<sup>152</sup> Confesercenti is the Italian shopkeepers association.

<sup>153</sup> See, for example, Catanzaro (1991) and Gambetta (1993) with reference to *Cosa Nostra*, Ciconte (1992) for ‘*ndrangheta* and Monzini (1999) for *Camorra* (all cited in Daniele and Marani, 2010).

to be close to nine billions of Euros (Confesercenti, 2009).<sup>154</sup>

A recent study conducted by Asmundo e Lisciandra (2008) tried to quantify the average value of the extortive request for business activities in Sicily. The source is that of judicial evidence for 2,286 enterprises, 646 of which have been forced to pay the “*pizzo*”, monthly or periodically, in the period 1987-2007. According to the authors: “...it is reasonable to assume that business activities which are similar for dimension and typology and which operate in the same territory, are subject to analogous forms of pressure by the criminal organization”. The data show a high variability of the “*pizzo*” depending on business size and on the sector in which the company operates. In general, the average Mafia-tax is approximately 300 Euros for month and for nearly 60% of the sample the extortion does not exceed 500 Euros for a month.<sup>155</sup> On the base of these data, the authors estimated that in 2009 the annual total revenues from extortion were higher than 1 billion of Euros in Sicily, which corresponds to more than the 1.3 percent of the regional GDP in the same year.

Since we have good reasons to believe that official data may underestimate the effective extent of extortion, we include in our OC index another crime which is symptomatic of the presence of the phenomenon: bomb attacks. Most of the times, in fact, bomb attacks are used to threaten and intimidate businessmen who refuse to pay extortion or politicians who refuse to collaborate. These offences, however, differently from those of extortion, cannot be hidden by the victims, so that they contribute to better capture the intensity of the phenomenon of extortion and of Mafia-type criminal organizations in general. As mentioned earlier, the sum of these five mafia-related crimes composes

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<sup>154</sup> More precisely, according to the “XII Report SOS Enterprise” (Confesercenti, 2009) the percentage of shops subject to extortion by the Mafia-type organizations is as high as 80% in the cities of Catania and Palermo (Sicily), 70% in Reggio Calabria (Calabria), 50% in Naples (Campania) and north of Bari and Foggia (Apulia). However, in the suburbs and hinterlands of these cities, the percentages are even higher and almost all the commercial activities are subject to extortion (not only shops but also restaurants, construction companies, etc.).

<sup>155</sup> The “XII Report SOS Enterprise” (Confesercenti, 2009) is even more specific in estimating the average value of the *pizzo*. According to this report, in fact, the average “black tax” paid by commercial activities (small grocery shops) in Palermo (Sicily) is 200-500 Euros a month, whereas is nearly 100-200 Euros a month in Naples (Campania). More elegant shops in the city centre pay almost 750-1000 Euros in Palermo and 500-1000 Euros in Naples. The average *pizzo* is even higher for supermarkets, which are forced to pay to the Mafia up to 5000 Euros a month in Palermo and up to 3000 Euros in Naples. Construction sites may pay up to 10000 Euros a month in Palermo.

our baseline OC proxy (OC Index5).<sup>156</sup> Nevertheless, as better explained later in the paper, in order to test the robustness of our benchmark findings we build a variety of other OC indexes which include also crimes of: arsons, “serious” robberies (i.e.: robberies in bank and post offices), and kidnappings. Crimes of arsons are considered because, as well as crimes of bomb attacks, they are indicative of the presence of extortion and of a more general intimidating activity of criminal groups. Robberies in banks and post offices, instead, are included since they are often related to OC as they require a high degree of organization and the collaboration of a plurality of individuals.<sup>157</sup> Finally, the inclusion of crimes of kidnapping is due to the fact that “historical” Mafias have specialized through time in this kind of offence, as also recognized by previous studies (e.g. Ciconte, 1992; Pinotti, 2011).<sup>158</sup>

Our estimation methodology utilises dynamic panel techniques: difference-GMM and system-GMM, already used in the empirical growth literature by, among others, Islam, (1995), and Beck *et al.* (2000).

These panel estimations seem to be the most appropriate since they are based on techniques that control for: i) potential endogeneity of the regressors ii) region-specific effects (difference-GMM), and iii) heteroskedasticity and autocorrelation within regions in dynamic, lagged-dependent variables models such as our growth regressions in equations (1) and (2).

More specifically, in the difference-GMM estimation, developed by Arellano and Bond (1991), the endogenous variables are instrumented with lags of their levels. While the system-GMM estimation, developed by Arellano and Bover (1995) and Blundell and Bond (1998), accounts for possible endogeneity by treating the model as a system of equations in first-differences and in levels. The endogenous variables in the first-difference equation are instrumented with the lags of their levels, whilst the endogenous variables in the level equation are instrumented with the lags of

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<sup>156</sup> Time-series trends of this Organized Crime Index (OC Index5) are presented in appendix. We show the trend for the 20 Italian regions (Figure 2) and the trend of each region relatively to the national trend (Figure 3).

<sup>157</sup> As we will better see later, “serious” robberies are included also in the OC index proposed by ISTAT.

<sup>158</sup> According to Ciconte (1992), among 620 kidnapping cases that have been registered in Italy in the period 1969-1989, approximately 200 can be attributed to ‘Ndrangheta (even those committed in North Italy); and only 8 of more than 400 billions that have been paid for kidnapping for extortion have been intercepted.

their first differences. An advantage of these GMM estimators is that they avoid a full specification of the serial correlation and heteroskedasticity properties of the error, or any other distributional assumption.

A difficulty associated with the two dynamic GMM estimators relates to the choice of the number of lags of the endogenous and predetermined variables. In order to restrict the number of instruments<sup>159</sup> we use a lag length of two and reduce the length of the maximum lags to four for difference- GMM and to three for system-GMM<sup>160</sup>. In all the cases we have to collapse the instruments<sup>161</sup>.

In both, system and difference-GMM we test the validity of the instruments by applying two specification tests. The first is the Hansen (1982) J-test of over-identifying restrictions which we use to examine the exogeneity of the instruments. The second test is the Arellano and Bond (1991) test for serial correlation of the disturbances up to second order. This test is important since the presence of serial correlation can cause a bias to both the estimated coefficients and standard errors. The appropriate check relates only to the absence of second-order serial correlation since first differencing induces first order serial correlation in the transformed errors.

### 3. Data

We use a panel of 19 Italian regions for the period 1983-2009.<sup>162</sup> Depending on the index of organized crime we use, however, the period considered in our estimations differs, due to data availability. Data on homicides by Mafia, criminal association (art. 416), extortion, arsons, and

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<sup>159</sup> An excessive number of instruments can result in an over fitting of the instrumented variables, thereby biasing the results towards those of the OLS, as pointed out by Roodman (2006). As a rule of thumb, therefore, the number of instruments is suggested not to exceed by far the number of countries/regions.

<sup>160</sup> As a robustness test, however, we also reduce the length of the maximum lags to two, as suggested by Roodman (2006) when the number of instruments exceeds the number of regions.

<sup>161</sup> The *collapse* sub option of *gmmstyle* specifies that the Stata command *xtabond2* should create one instrument for each variable and lag distance, rather than one for each time period, variable, and lag distance. In large samples, collapse reduces statistical efficiency; but in small samples, it can avoid the bias that arises as the number of instruments climbs toward the number of observations. (When instruments are many, they tend to over-fit the instrumented variables and bias the results toward those of ordinary and generalized least squares). [Roodman, 2006].

<sup>162</sup> We exclude Valle d'Aosta, since it is the smallest and richest region and it is usually excluded in the existing empirical analysis for Italian regions, being treated as an outlier.

robberies in banks and post offices are available from 1975, while those on Mafia criminal association (art. 416 bis) and bomb attacks are available only since 1983<sup>163</sup>. Table A in the Data Appendix provides definitions, sources and the exact period availability of the data, while Table 1 presents some summary statistics.

Following the standard approach, we construct 7 non-overlapping 4-year period averages (1983-86, 1981-90, ..., 2007-09) in order to minimize business cycles effects. This implies a maximum sample size of 152 observations when we use our baseline measure of organized crime (OC Index5), though we end up working with an unbalanced panel of 133 observations due to missing data.<sup>164</sup>

An initial assessment of the relationship between corruption and growth is given in the first cross-region scatter plot in Figure 1 in the Data Appendix, which shows a negative correlation between the two variables, with the correlation coefficient equal to -0.53 ( $p=0.000$ ). The other graphs in Figure 1 display cross-region scatterplots of the level of growth against three alternative measures of organized crime (i.e.: extortion, arsons, and OC Index5). All of the scatterplots show a negative relationship between organized crime and growth, with the correlation coefficient ranging between -0.18 and -0.35. Given this visual support, we are encouraged to pursue a more formal analysis of the importance of these variables in influencing growth, both independently of each other and jointly through their interaction.

Table B in Data Appendix reports the correlation matrix of alternative measures of OC, showing that they are highly and significantly correlated (the correlation between our baseline measure of organized crime and the index used by Daniele and Marani (2010) is, e.g., equal to 0.841, while

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<sup>163</sup>As mentioned earlier, the crime of “Mafia criminal association” (art. 416 bis) has been introduced in the Italian Penal Code only in 1983. Data on the sum of robberies in banks and post offices, kidnapping for extortion, and extortion, instead, are available since 1961 from CRENOS.

<sup>164</sup>When we use the measure of OC available since 1961, we construct 13 non-overlapping 4-year period averages (1961-64, 1965-68, ..., 2008-2009) and the maximum sample size is 238, though we end up working with an unbalanced panel of 171 because of missing data.

with the ISTAT index is equal to 0.596). The same Table B also shows the correlation matrix between different Mafia-related crimes. As we can see, Mafia association is strongly and positively correlated to homicides by Mafia, criminal association, bomb attacks and extortion.

#### 4. Baseline Results

We begin our analysis by estimating equation (1) first with fixed effects, in order to account for region-specific effects, and then with difference-GMM and system-GMM to account also for the endogeneity of all the right-hand side variables. The results are reported in Table 2. They illustrate the typical findings of growth regressions: there is conditional income convergence, a positive statistically significant effect of investment, and a negative statistically significant effect of inflation.<sup>165</sup> As already found in the empirical growth literature for the case of Italy (e.g. Di Liberto, 2008), the coefficient on education is found to be statistically insignificant or negative.<sup>166</sup> This may be due to the measure we use in order to proxy human capital: secondary school enrolment rates. However we rely on the availability of the data, and given the length of the period of time we analyze these are the best data we have access to. The last column also shows the significant effects of trade and public spending<sup>167</sup>.

With regard to the variables of interest, confirming past studies we find an inhibiting effect of corruption on growth. More interestingly, the coefficient on the interaction term,  $\beta_2$ , is found to be

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<sup>165</sup> Notice that income convergence is always found when we control for fixed effects.

<sup>166</sup> Di Liberto (2008) studied the connection between growth and human capital in a convergence regression for the panel of Italian regions. The author included measures of average, primary, secondary and tertiary education, finding that increased education seems to contribute to growth only in the South. Moreover, by decomposing total schooling into its three constituent parts, she finds that only primary education in the South seems to be important. These results can be interpreted in terms of distorted structural composition of the labour force and inefficient allocation of human capital across sectors. For a more clear view of the effects of human capital on the economic growth of Italian regions see also Hirsch and Sulis (2008). At a cross-country level, different studies (e.g. Benhabib and Spiegel, 1994) have found that the change in education is not a determinant of economic growth. For a more precise analysis of the effects of education on growth see, for example, Krueger and Lindahl (2001).

<sup>167</sup> More specifically, trade is found to have a statistically significant positive effect on growth, as we would expect. While public spending (i.e.: government purchases) is found to have a statistically significant negative effect on growth, as already established by several empirical studies using cross-national data sets (e.g. Landau, 1983; Kormendi and Meguire, 1985; Barro, 1991; for the case of Italy, see e.g. Auteri and Costantini, 2003). The coefficient on population growth, instead, is found to be positive but statistically insignificant, differently from what we would expect on the base of existing empirical growth analysis, which predict a statistically significant negative sign (e.g. Barro, 1991).

positive and statistically significant (even at the 10% level for most the regressions), suggesting that the negative effect of corruption on the rate of GDP per capita growth is smaller, or even positive, in regions where there is a high presence of OC. This finding lends support to the claims according to which the way how corrupt activities are organized may influence economic growth in a different manner.

Relative to instrumentation, when using GMM techniques (columns 2 to 4 in Table 2) we consider all the right-hand side variables of equation (1) as endogenous. Therefore, the small number of Italian regions constrains us to reduce the maximum number of lags to five for difference-GMM and to three and two lags for system-GMM, in order to maintain the number of instruments at a minimum.<sup>168</sup> For the same reason, we also collapse the instrument set. Even doing so, the number of instruments in difference-GMM slightly exceeds the number of regions (column 2 in Table 2), while in system-GMM the number of instruments is exactly equal to number of regions (columns 3 and 4 in Table 2). In each case, however, the instruments are confirmed as valid by the Hansen (1982) specification test, which cannot reject the null hypothesis of instrument exogeneity even at the 10% level of significance. Additionally, the Arellano and Bond (1991) test does not reject the null hypothesis of no second-order serial correlation, at the 10% level.<sup>169</sup>

To better understand these preliminary findings, we continue our analysis by estimating equation (2) with difference-GMM and system-GMM using the baseline set of controls and a variety of organized crime measures. Our findings are presented in Table 3. Panel A shows the results based on difference-GMM, while Panel B reports those based on system-GMM.

The five columns show the outcomes obtained using different measures of organized crime. Column (1) reports the difference and system-GMM results found by using the simplest index of organized crime: data on Mafia criminal association (number of crimes per 100,000 inhabitants).

The following columns, (2) to (5), refer to indexes constructed by adding to the first index the

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<sup>168</sup> We have to reduce the number of lags to two when using system-GMM to estimate equation (1) with additional control variables (i.e.: population growth, trade, and public spending- Column 4 in Table 2).

<sup>169</sup> The appropriate check relates only to the absence of second-order serial correlation since first differencing induces first order serial correlation in the transformed errors.

following types of OC: homicides by Mafia, criminal association, bomb attacks and extortion.<sup>170</sup>

The index used in column (5) is the most complete measure and represents our baseline index of organized crime (OC Index5).

The effects of the controls included in vector  $\{X_{j,it}\}$  confirm those in Table 2. We can also see that our main conjecture is strongly supported in each case. The coefficients on corruption and organized crime are negative and statistically significant in all the regressions, while the coefficient on the interaction term *Corruption\*OC* is always positive and statistically significant. Thus, the two phenomena have both a growth inhibiting effect; however the negative impact of corruption on growth appears to be less severe in the presence of criminal organizations, as suggested by the coefficient on the interaction term. This result points, once again, to the importance of considering the organization structure of corruption activities in order to better assess their impact on growth.

Our findings are qualitatively very strong. Nevertheless, as we would logically expect, the magnitude of the three coefficients of interest varies depending on the measure of organized crime we consider.

With regard to instrumentation, when using both GMM techniques we consider all the right-hand side variables of equation (2) as potentially endogenous. Because of this, the small number of Italian regions forces us to restrict the maximum number of lags to four for difference-GMM and to three for system-GMM, in order to keep the instruments at a minimum. For the same reason, we also collapse the instrument set. Even doing so, the number of instruments slightly exceeds the number of regions, in each case. Nevertheless, our instruments are confirmed as valid by the Hansen (1982) specification test, which cannot reject the null hypothesis of instrument exogeneity even at the 10% level. Furthermore, the Arellano and Bond (1991) test does not reject the null of no second-order serial correlation, at the 10% level.

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<sup>170</sup> The crimes are added to the first index one at a time. All the indexes are expressed in terms of rates per 100,000 inhabitants.

## 5. Robustness checks

Having found strong support for our thesis so far, this section tests the robustness of our baseline results under various modifications. These include: (i) robustness to different specifications (ii) robustness to alternative measures of OC.

### *5.1. Robustness to Different Specifications.*

As previously discussed, a difficulty associated with the dynamic GMM estimators relates to the choice of the number of lags of the endogenous variables. All our previous system-GMM results have been obtained by using a length of two to three lags and by collapsing the instruments in order to limit their number. As a robustness test, however, we further reduce the length of the maximum lags to two, as suggested by Roodman (2006). The results are shown in column (2) of Table 4, while column (1) reproduces column (5) of Panel B in Table 3 for comparison purposes. As can be seen, our findings remain intact.

We further check the robustness of our baseline findings by adding (once at a time) additional control variables that usually appear in growth regressions: the rate of population growth, the share of total public spending to GDP, the ratio of trade to GDP, and a measure of financial development. The results are reported in columns (3) to (6) of Table 4. Once again, our main results remain unaltered, with some of the additional regressors having the expected sign and being statistically significant (population growth, trade, and financial development).

Given that in some regions (i.e.: Puglia, Basilicata, Lazio, Liguria, Molise) OC is a more recent phenomenon, it is possible that our results are driven by the variation of OC across time. In order to control for these effects we estimate the regression by adding interaction terms between corruption,

organized crime and decades dummies.<sup>171</sup> Results are reported in column (7) of Table 4, and they show that decadal OC differences do not matter. However, it is possible that our findings are driven by regional differences in OC experience. We account for such regional dissimilarities by adding interaction terms between corruption, organized crime and territorial dummy variables for regions where organized criminality is more widespread<sup>172</sup>. Results are reported in column (8) of Table 4. We can see that our main thesis continues to be strongly supported and once we account for the interaction of OC and corruption at the cross-regional level, the region-specific estimates are not statistically significant.

In each case, the validity of the instruments is confirmed by the Hansen (1982) and Arellano and Bond (1991) tests.

Column (1) in Table 4a replicates Column (5) of Table 3-Panel B for comparison. In column (2) we show the results of the regression that includes the lag of the dependent variable among the benchmark set of explanatory variables.<sup>173</sup> We run this robustness test because, even if our regression may be seen as dynamic since we include the initial level of GDP per capita among the explanatory variables<sup>174</sup>, however, given that GMM methods are designed to estimate dynamic regressions which include the lag of the depend variable, we want to prove that our results would not change. In Column (3) of the same table we report the results of the benchmark regression plus corruption square. We run this robustness test in order to show that our results do not derive from the fact that the interaction term between corruption and organized crime captures corruption

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<sup>171</sup> When we use our baseline measure of OC we consider the period 1983-2009. For this reason we account for the two decades 1980's and 1990's, excluding the 2000's to avoid the so-called "dummy trap".

<sup>172</sup> As before, the regions have been classified on the base of the data on Mafia-type criminal association (art. 416 bis of the Italian Penal Code) averaged for the period 1983-2009, as already done by Pinotti (2011). The regions with the highest number of these crimes, in diminishing order, are: Sicily, Calabria, Campania, Puglia, Basilicata, Molise, Lazio, and Liguria.

<sup>173</sup> Notice that all our System-GMM regressions work well including also the lag of the dependent variable. Results are available on request.

<sup>174</sup> It is common in the growth literature to do not include the lag of the dependent variable among the explanatory variables, but still consider the regression dynamic given the inclusion of the initial level of income among the controls. This allows to estimate growth regression with GMM even in the absence of the lag of the dependent variable in the right hand side.

squared<sup>175</sup>. In fact, as it can be seen, our baseline results are still valid even if when we introduce the corruption term squared. Additionally, the coefficient of the squared term comes out positive and statistically significant, showing the non linearity of corruption (corruption has a negative effect on the GDP pc growth, which becomes positive for very high levels of the phenomenon).

## ***5.2. Robustness to Alternative measures of Organized Crime.***

For the most part of the preceding analysis we have used OC Index5 as our preferred measure of organized crime. The literature, however, has used different indexes in order to proxy for the presence of criminal organizations, and it is important to verify that our results can be established also with the use of other measures. For this reason, we construct a certain number of indexes by considering different combinations of “mafia-related” crimes and we use them alternatively through our estimations of equation (2). The results are reported in Table 5. All the different indexes are highly and significantly correlated, as it can be seen from Table B in the Data Appendix.

Column (1) of Table 5 replicates column (5) of Table 3-Panel B for comparison. As discussed previously in the paper, this baseline measure is built as the sum of official data recorded on five different crimes that by definition reflect the presence of criminal organizations or that are symptomatic of the presence of criminal organizations (i.e.: criminal association, Mafia criminal association, homicides by Mafia, bomb attacks and extortion). Column (2), instead, reports the outcomes found by using an index that does not account for the crime of “criminal association”, but considers only crimes of Mafia association, homicides by Mafia, bomb attacks and arsons. The crimes of arsons and bomb attacks are considered in order to proxy for extortion, which is excluded in this measure. It is, in fact, largely recognised that these offences are frequently used in order to

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<sup>175</sup> Notice that the correlation between corruption and organized crime is not very high (as it can be seen in the Spearman’s Correlation Matrix in appendix), so that it is highly improbable that the interaction term between the two terms is capturing the non linearity of corruption. Moreover, the data we use actually capture two different phenomena by definition. Finally, if the corruption and organized crime terms were measuring the same phenomenon, one of the two coefficients would come out statistically insignificant.

intimidate businessmen unwilling to pay for extortion (see e.g.: Confesercenti, 2009; Daniele and Marani, 2010).

The results reported in the following three columns have been obtained by using measures of OC which include all the crimes considered in the baseline index, plus crimes of arsons (Column 3), crimes of kidnapping for extortion (Column 4), and crimes of arsons and kidnapping for extortion (Column 5). The inclusion of crimes of kidnapping is due to the fact that “historical” Mafias have specialized through time in this kind of offence, as also recognized by Pinotti (2011).<sup>176</sup> The estimates in Column (6), instead, have been found by measuring OC with the Index proposed by Daniele and Marani (2010). This measure accounts only for certain Mafia-related crimes, which are: extortion, bomb attacks, arsons, criminal association and Mafia criminal association. Differently from our baseline index, then, this measure includes arsons and excludes homicides by Mafia. However, as it can be seen in Table B in Data Appendix and as we would expect, the two indexes are highly and significantly correlated (0.841).

Another measure of OC that has been used in the literature, by e.g. Caruso (2008), is that proposed by the Italian National Institute of Statistics (ISTAT) and available only for the periods 1995-2003, 2006, 2008-2010. Based on the definition of criminal organization given by the Italian Minister of Interiors, this index includes crimes of: homicides by Mafia, bomb attacks, arsons and “serious” robberies (such as robberies in banks and post offices). Column (7) shows the estimation results obtained by proxing OC with an index that accounts for the crimes suggested by ISTAT.<sup>177</sup>

The alternative measures we have seen until now include crimes for which data are available for the period 1983-2009. However, in order to test our results for a longer period of time, we construct another index of OC, which is less definite but can go all the way back to 1961. This measure is

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<sup>176</sup>Pinotti (2011) refers to crimes of Kidnapping, and not kidnapping for extortion. However, also in that case the author finds a significant positive correlation between the two different typologies of crimes (Mafia criminal association vs kidnapping). On the other hand, we consider crimes of kidnapping for extortion, and find a positive and significant correlation with mafia criminal association’s crimes (see Table B in Data Appendix).

<sup>177</sup> Rather than using directly the index given by ISTAT, we build an index as the sum of OC’s offences recommended by the same institute. This is due to the fact that the original is available for a shorter period of time, as underlined before. Our measure, instead, is able to cover the period 1983-2009.

built as the sum of crimes on: robberies (in banks and post offices), kidnapping for extortion and extortion. The results are shown in Colum (8). At the same time, and differently from other typologies of property crimes (such as thefts and burglaries), “serious” robberies are considered since they are often related to OC as they require a higher degree of organization and the collaboration of a plurality of individuals.<sup>178</sup>

In all these cases, as we can see in Table 5, our main thesis continues to be strongly supported and does not seem to be affected by the specific measure adopted to proxy for OC presence. In all the cases, instruments are confirmed to be valid by the Hansen (1982) and Arellano and Bond (1991) tests.

## **6. Conclusions**

Using dynamic panel model estimations for a data set of 19 Italian regions over the period 1983-2009, we find that corruption and organized crime have both a growth-inhibiting effect. Additionally, we find that in the presence of criminal organizations the negative impact of corruption on growth is less severe. The latest finding may explain why in Italy corruption is less harmful than in other countries, and it seems to support the argument that when the phenomenon has some form of organization, it is less distorting for growth, as theoretically shown in the context of a dynamic general equilibrium model by Blackburn and Forgues-Puccio (2009). There exist a number of studies focused on the links between corruption and OC, however most of them analyze the phenomena from a sociological point of view or from a theoretical microeconomic point of view. To the best of our knowledge, there are not empirical analyses of the two phenomena jointly considered in the context of a growth regression. The investigation we have presented in this paper, then, is a contribution which aims to fill this gap. In addition, our study could be extended to allow for a theoretical investigation that considers the two phenomena at the same time. The model presented by the two authors cited above, in fact, compares organized corruption versus

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<sup>178</sup> On the other side, thefts and burglaries do not need stable and repeated interactions among individuals. As a consequence, the presence of OC does not increase the incidence of these crimes.

disorganized corruption, but it does not account for OC. It may be the case that the organization among bureaucrats in the presence of OC leads to a level of bribes even lower. It is important to emphasize that we are not giving a prescription for organized crime, but we have just tried to give an explanation to the fact that corruption seems to have a less harmful effect in Italy rather than in other countries. Then, the suggestion for policy makers when deciding new anti-corruption policies is that to better understand the nature of the phenomenon of corruption and to do not ignore the possible links with other illegal phenomena present in the economy.

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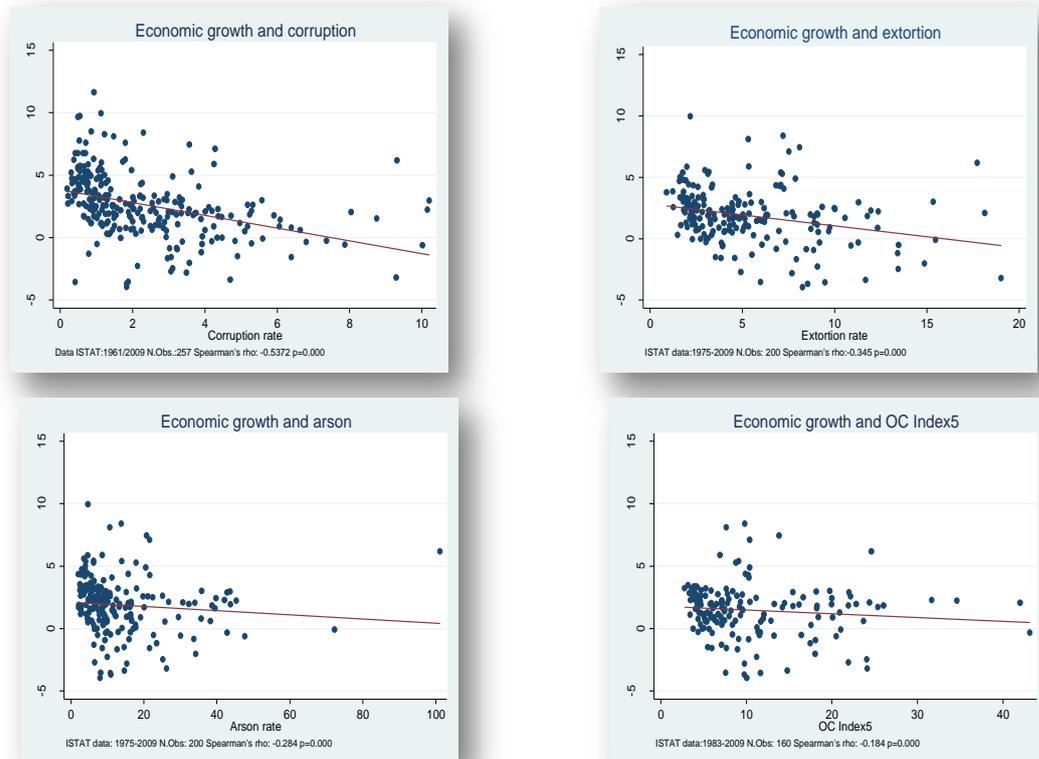
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# Appendix

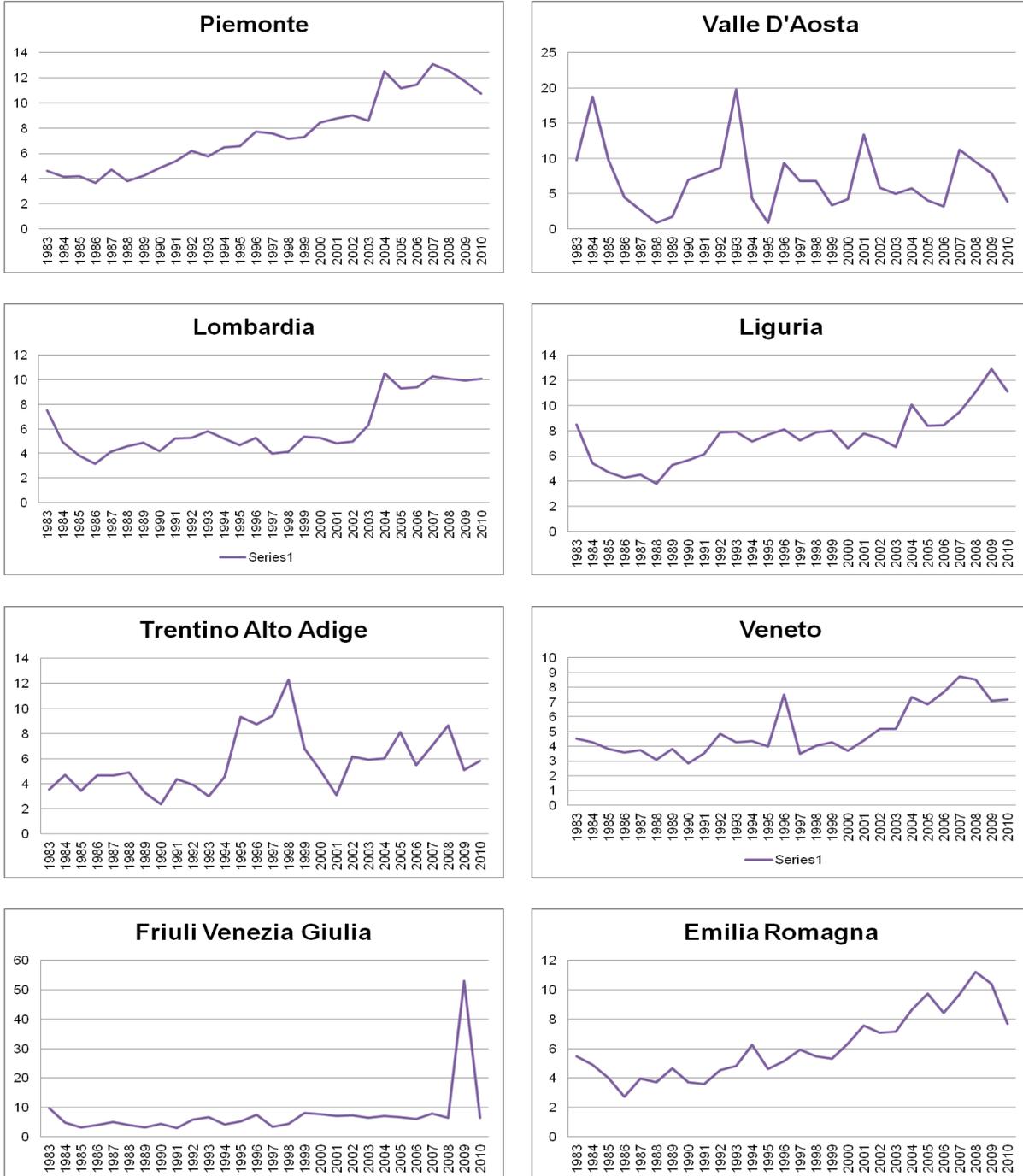
**Figure 1**  
**Economic Growth, Corruption and Organized Crime**

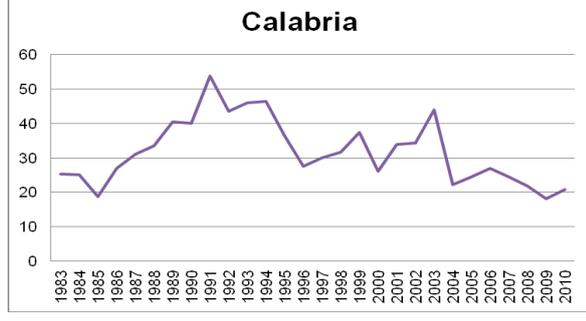
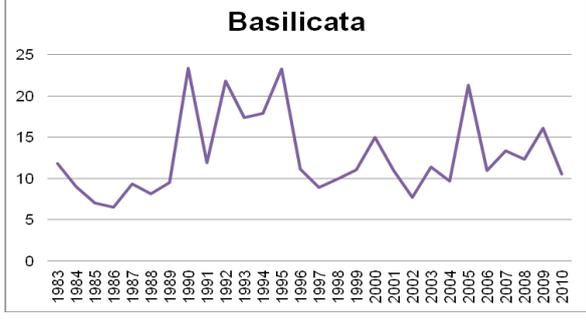
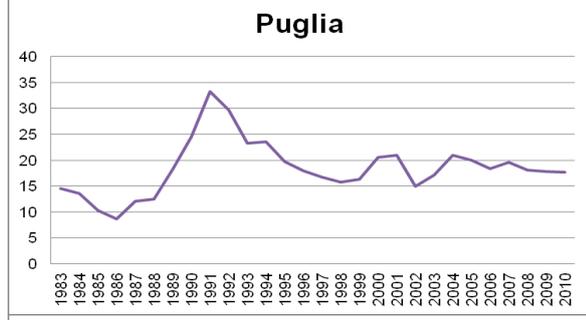
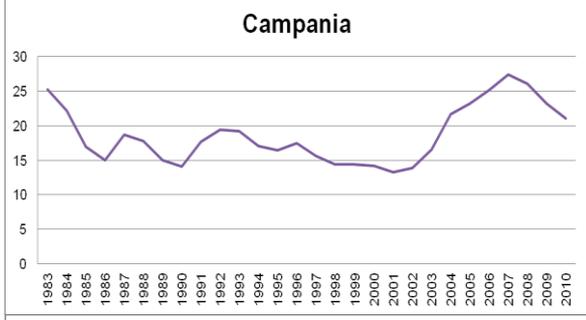
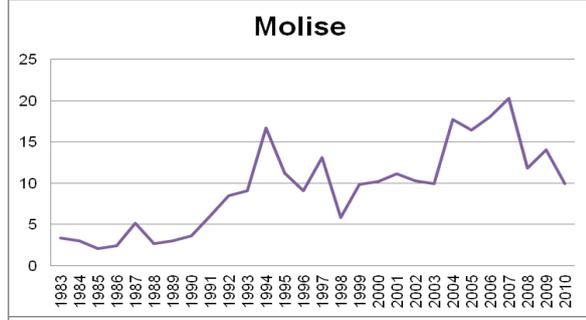
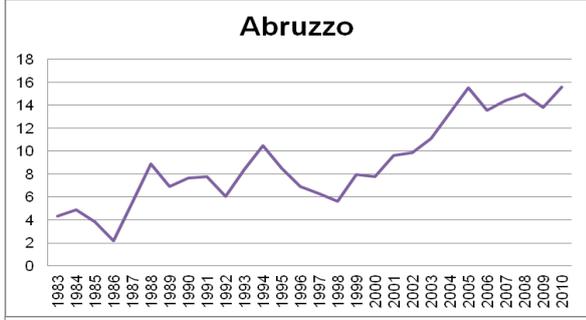
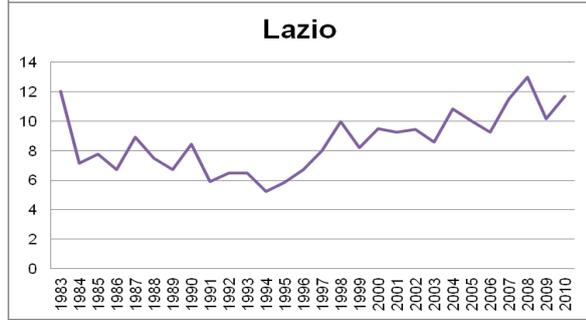
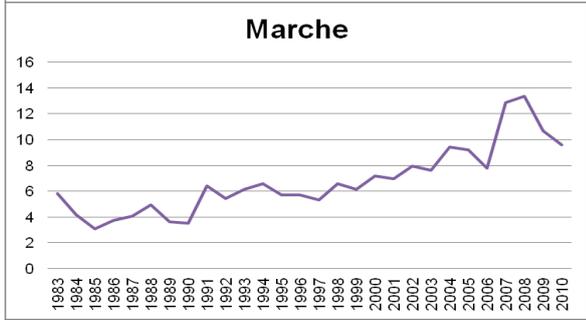
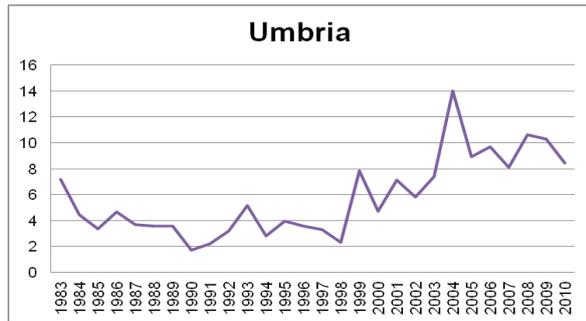
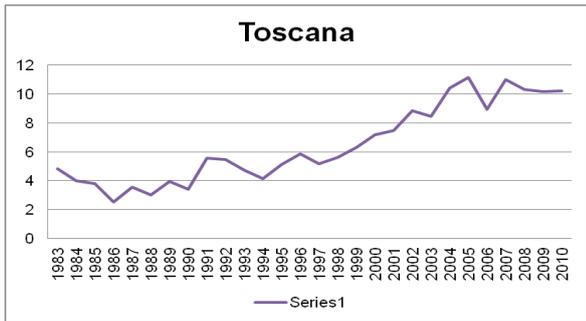


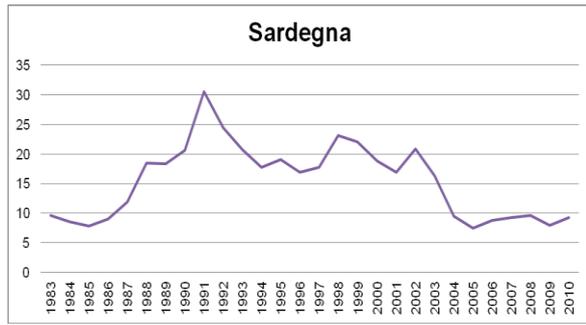
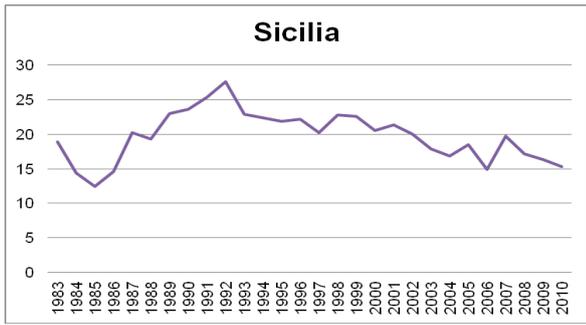
*Notes: Economic Growth: GDP per capita growth rate (average 1961-2009). Corruption rate: the official number of crimes against Public Administration per 100,000 inhabitants published by the Italian National Institute of Statistics- ISTAT (average 1961-2009). Extortion: number of extortions per 100,000 inhabitants reported by the police to the judicial authorities and published by ISTAT (average 1975-2009). Arsons: number of arsons per 100,000 inhabitants reported by the police to the judicial authorities and published by ISTAT (average 1975-2009). OC Index5: sum of five different crimes which are mafia-related: homicides by mafia, mafia association, criminal association, bomb attacks and extortion (ratios over 100,000 inhabitants, average 1983-2009). Source: ISTAT-Annals of Judicial Statistics.*

**Figure 2**

**Time Series Trend (1983-2010) of Organized Crime Index 5 (Mafia association+criminal association+homicides by mafia+bomb attacks+ extortion, rate per 100,000 inhabitants)**

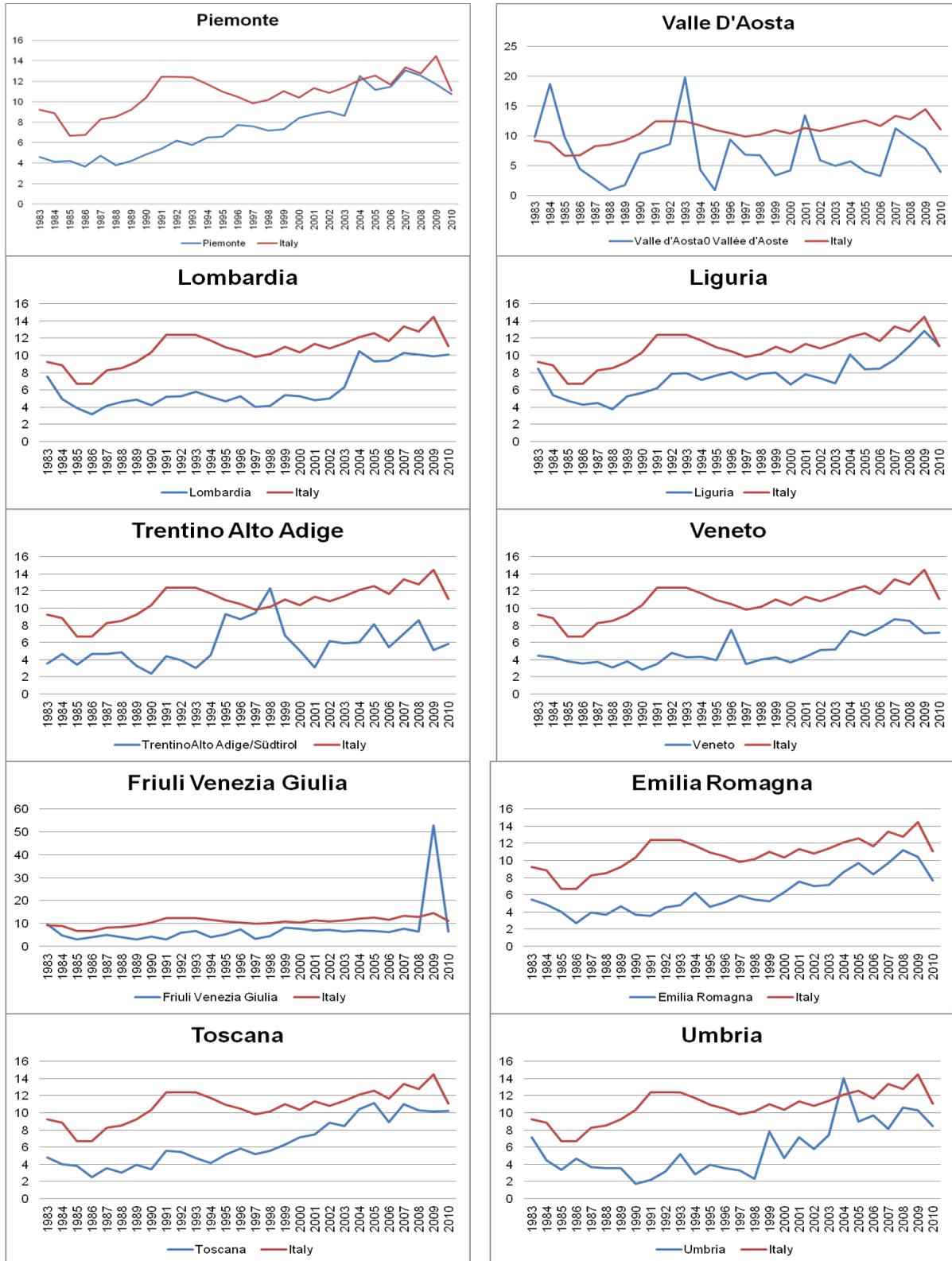


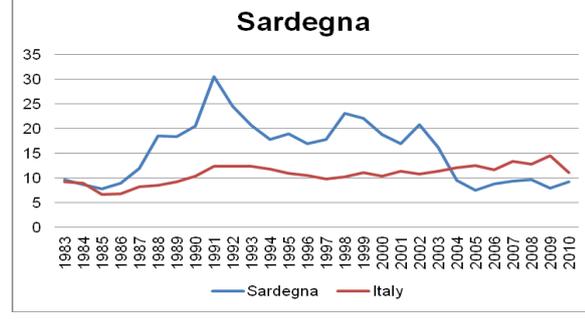
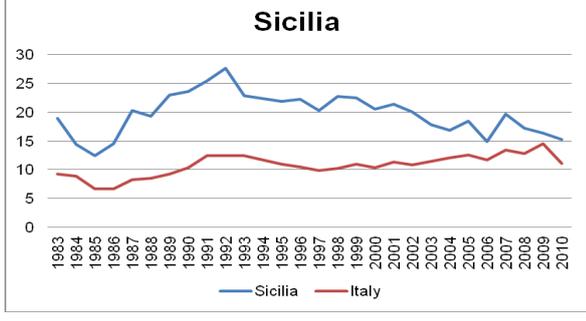
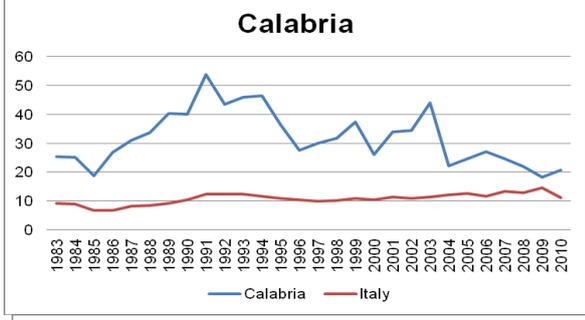
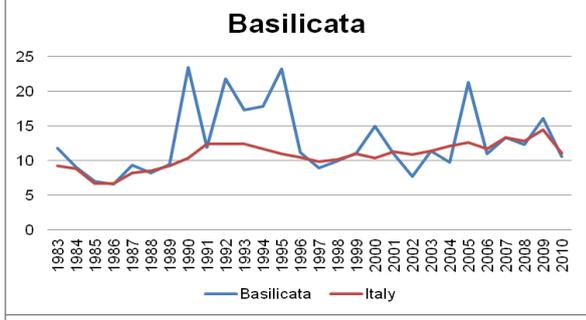
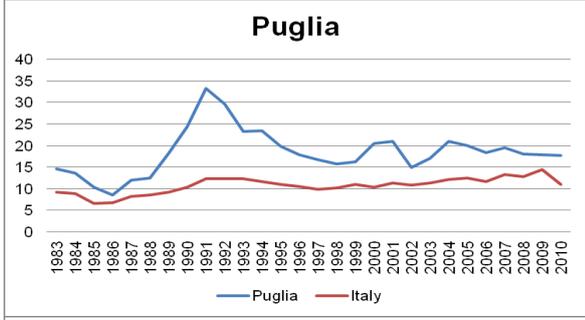
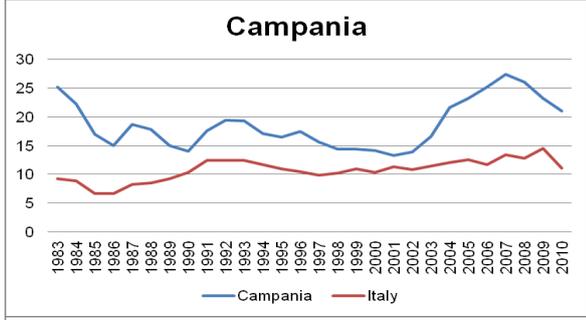
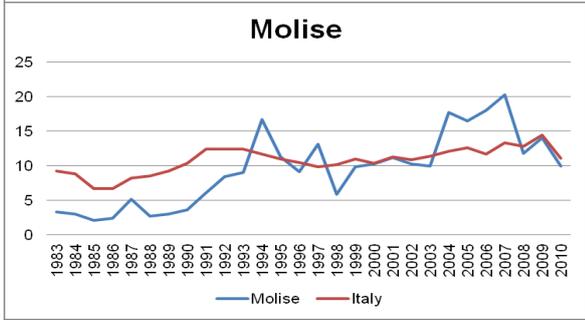
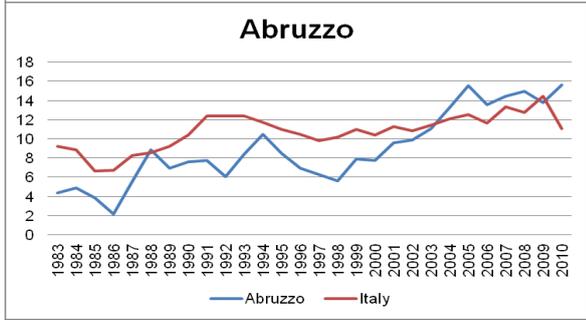
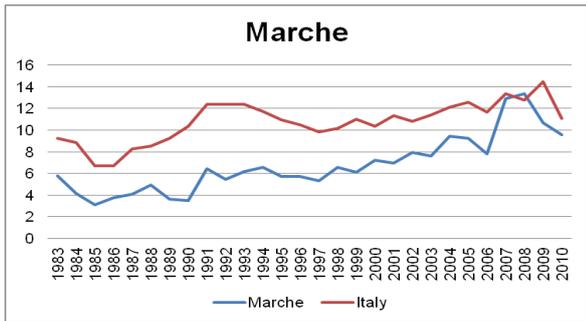




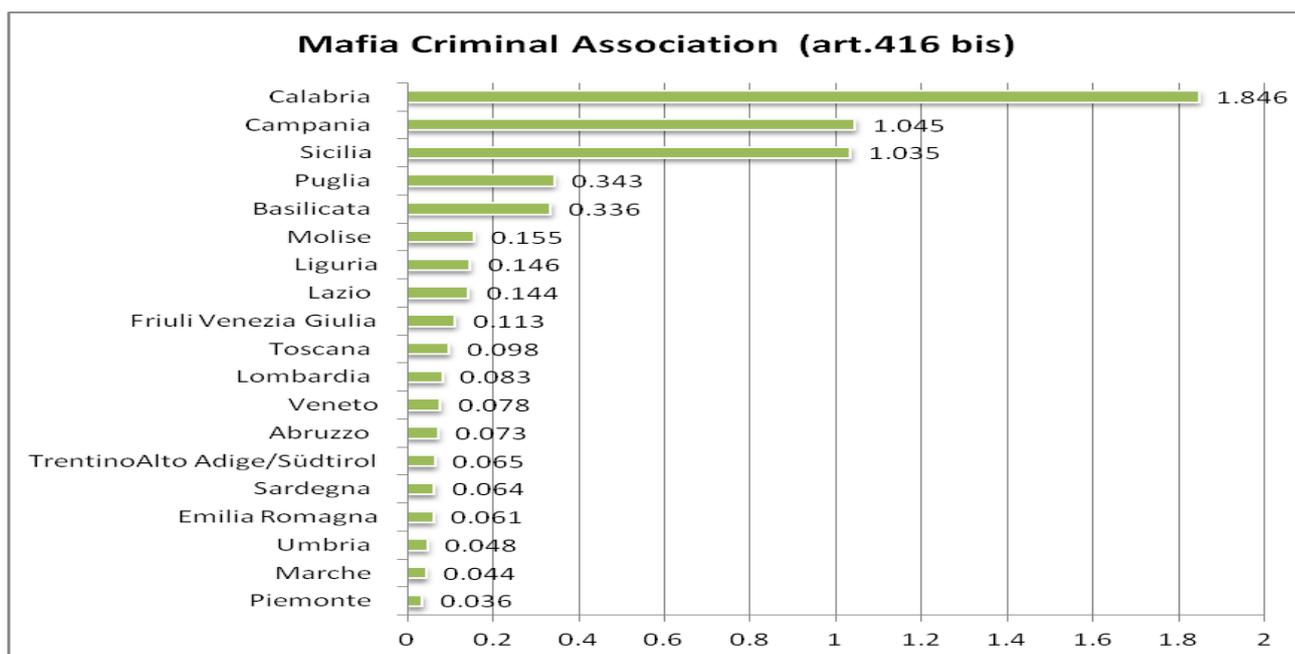
**Figure 3**

**Time Series Trend (1983-2010) of Organized Crime Index 5 (Mafia association+criminal association+homicides by mafia+bomb attacks+ extortion, rate per 100,000 inhabitants). Region vs Italy**

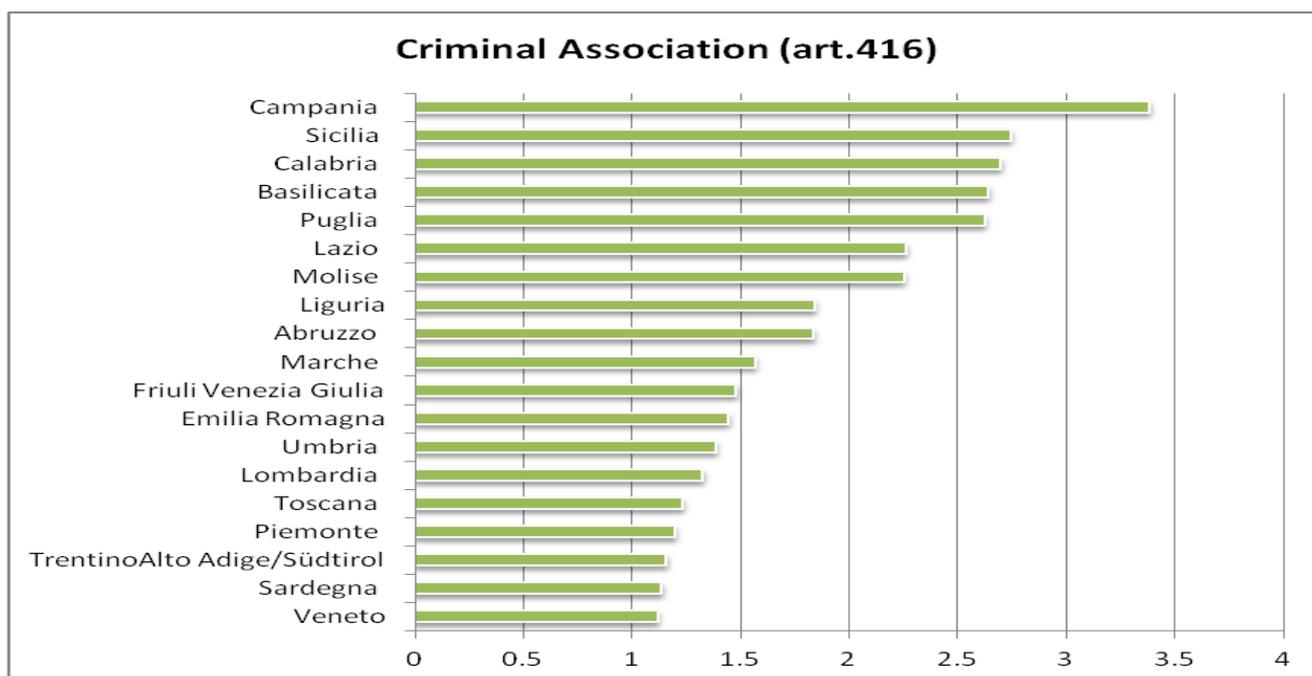




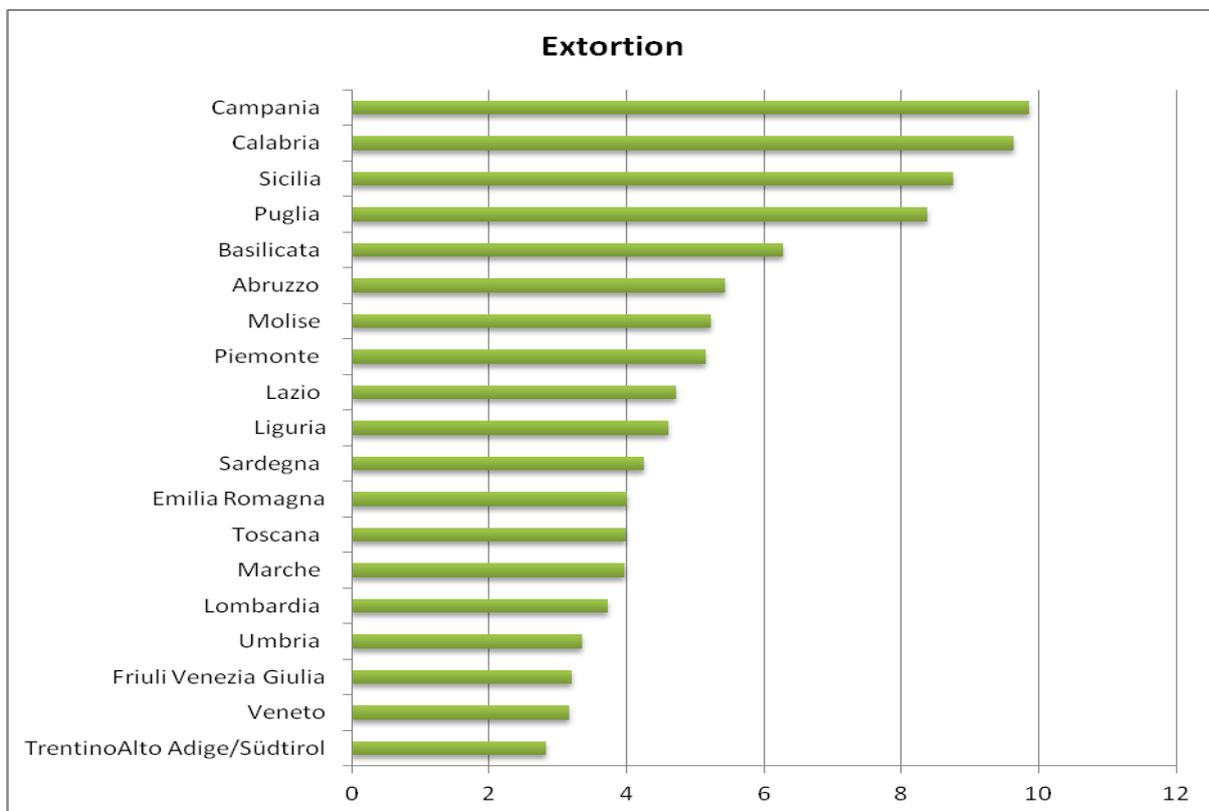
**Figure 4**  
**Rankings of the Italian regions for the 5 components of our Organized Crime Index**



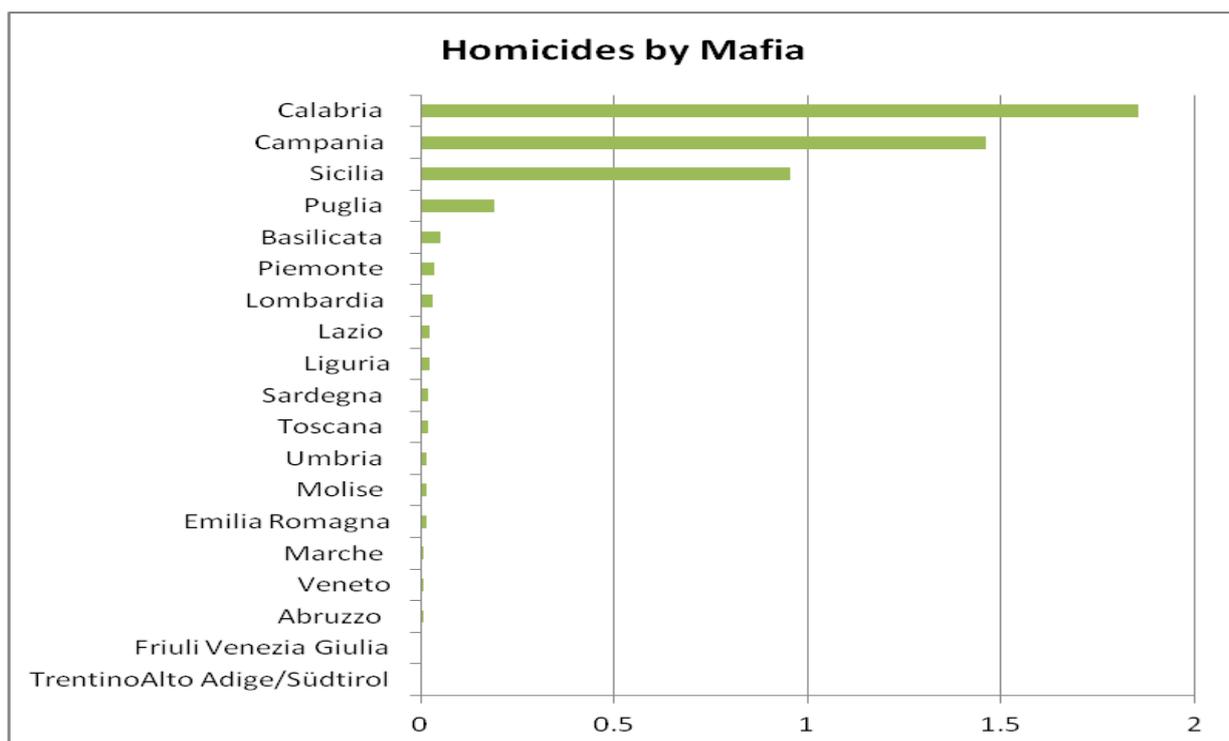
*Mafia criminal association rate per 100,000 inhabitants -Average: 1983-2009. Source: elaboration of the author using ISTAT data (Annals of Judicial Statistics).*



*Criminal association rate per 100,000 inhabitants -Average: 1975-2009. Source: elaboration of the author using ISTAT data (Annals of Judicial Statistics).*

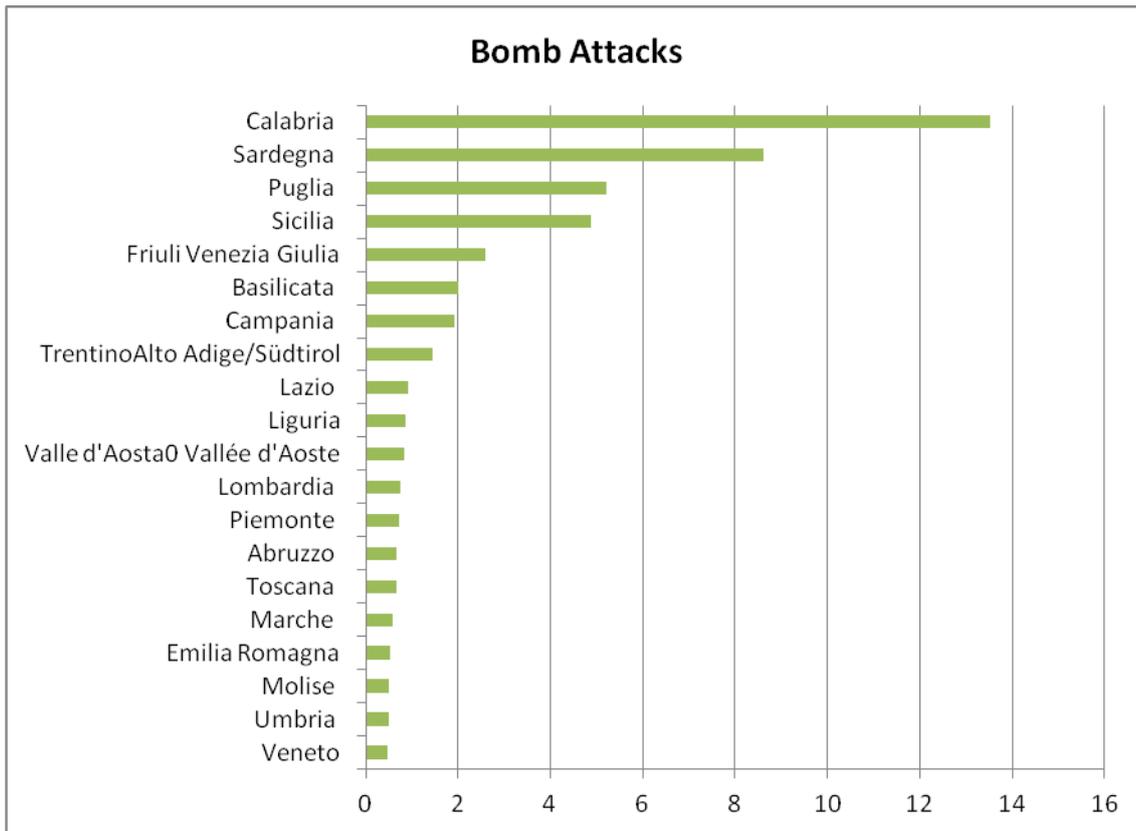


*Extortion rate per 100,000 inhabitants -Average: 1975-2009. Source: elaboration of the author using ISTAT data (Annals of Judicial Statistics)*



*Homicides by Mafia rate per 100,000 inhabitants -Average: 1975-2009. Source: elaboration of the author using ISTAT*

data (Annals of Judicial Statistics)



Bomb Attacks rate per 100,000 inhabitants -Average: 1975-2009. Source: elaboration of the author using ISTAT data (Annals of Judicial Statistics)

**Table A**  
**Description of Variables and Sources**

Variables	Description	Sources
<b>GDP growth pc</b>	Log difference of GDP per capita in thousands of millions of lire ( <i>constant prices 1990</i> )	ISTAT- Annals of Statistics and Crenos-1961/2009
<b>Initial GDP pc (log)</b>	Log of initial GDP per capita in thousands of millions of lire ( <i>constant prices 1990</i> )	ISTAT- Annals of Statistics and Crenos-1961/2009
<b>Investment</b>	Share of gross private investment (as % of GDP)	ISTAT- Annals of Statistics and Crenos-1961/2009
<b>Education</b>	Percentage of population in age range 14-18 registered in high school	ISTAT- Annals of Statistics and Crenos-1961/2009
<b>Inflation</b>	GDP deflator	ISTAT- Annals of Statistics and Crenos-1961/2009
<b>Population growth</b>	Population growth rate	ISTAT- Annals of Statistics - 1961/2009
<b>Public spending</b>	Share of total public spending (as % of GDP)	ISTAT- Annals of Statistics - 1961/2009
<b>Trade</b>	Share of trade (as % of GDP)	ISTAT- Annals of Statistics - 1961/2009
<b>Financial development</b>	Share of value added of financial and banking sector (as % of GDP)	ISTAT- Annals of Statistics and Crenos-1975/2009
<b>Corruption</b>	Number of crimes against Public Administration (PA) based on Statues no.286 through 294. Excluding crimes against PA that do not involve corruption such as Statute 279 (insulting a public officer) and Statute 295 (neglect or refusal of an official duty). reported to the police , per 100,000 inhabitants.-Embezzlement and misallocation of public funds.	ISTAT- Annals of Judicial Statistics -1961/2009
<b>Extortion</b>	Number of crimes of extortion denounced, per 100,000 inhabitants	ISTAT- Annals of Judicial Statistics -1975/2009
<b>Criminal Association (art.416)</b>	Number of crimes of criminal association, per 100,000 inhabitants, defined as: <i>"the association of three or more people who are organized in order to commit a plurality of crimes"</i>	ISTAT- Annals of Judicial Statistics -1975/2009
<b>Mafia Criminal Association (art.416 bis)</b>	Number of crimes of Mafia criminal association , per 100,000 inhabitants, defined as: <i>the association is of the Mafia type when its components use intimidation, awe and silence in order to commit crimes, to acquire the control or the management of business activities(i.e.: concessions, permissions, public contracts or other public services), to derive profit or advantages for themselves or others, to limit the freedom of exerting the right to vote, and to find votes for themselves or others during the electoral campaign".</i>	ISTAT- Annals of Judicial Statistics -1983/2009
<b>Homicides by Mafia</b>	Number of homicides by mafia, per 100,000 inhabitants	ISTAT- Annals of Judicial Statistics -1975/2009
<b>Arsons</b>	Number of arsons , per 100,000 inhabitants	ISTAT- Annals of Judicial Statistics -1975/2009
<b>Bomb Attacks</b>	Number of bomb attacks, per 100,000 inhabitants	ISTAT- Annals of Judicial Statistics -1983/2009
<b>Robberies in Banks</b>	Number of robberies in banks, per 100,000 inhabitants	ISTAT- Annals of Judicial Statistics -1975/2009
<b>Robberies in Post Offices</b>	Number of robberies in post offices, per 100,000 inhabitants	ISTAT- Annals of Judicial Statistics -1975/2010
<b>Kidnapping for extortion</b>	Number of kidnapping for extortion, per 100,000 inhabitants	ISTAT- Annals of Judicial Statistics -1975/2011
<b>OC Index5</b>	Sum of the following crimes: Mafia criminal association, homicides by Mafia, criminal association, bomb attacks, extortion; per 100,000 inhabitants	ISTAT- Annals of Judicial Statistics -1983/2009
<b>OC Index ISTAT</b>	Sum of the following crimes: homicides by Mafia, bomb attacks, arsons, serious robberies( in banks and post offices); per 100,000 inhabitants	ISTAT- Annals of Judicial Statistics -1983/2009
<b>OC Index CRENOS</b>	Sum of the following crimes: extortion, kidnapping for extortion, serious robberies ( in banks and post offices); per 100,000 inhabitants	ISTAT- Annals of Statistics and Crenos-1961/2009
<b>OC Index Daniele-Marani</b>	Sum of the following crimes: extortion, bomb attacks, arsons, criminal association, Mafia criminal association; per 100,000 inhabitants	ISTAT- Annals of Judicial Statistics -1983/2009
<b>PCA OC Index5</b>	PCA of the following crimes: Mafia criminal association, homicides by Mafia, criminal association, bomb attacks, extortion; per 100,000 inhabitants	ISTAT- Annals of Judicial Statistics -1983/2009

**Table B**  
**Matrix Spearman Correlation of Alternative Organized Crime Measures and Corruption**

Crimes	Corruption	Mafia criminal ass.	Criminal association	Homicides by Mafia	Bomb Attacks	Extortion	Arsons	OC Index5	OC Index ISTAT	OC Index CRENOS	OC Daniele Marani	PCA OC Index5
Corruption	1											
Mafia criminal association	0.120 (0.131)	1										
Criminal association	0.057 (0.426)	0.547 (0.000)	1									
Homicides by Mafia	0.059 (0.410)	0.587 (0.000)	0.313 (0.000)	1								
Bomb Attacks	-0.047 (0.555)	0.423 (0.000)	0.279 (0.000)	0.405 (0.000)	1							
Extortion	0.525 (0.000)	0.253 (0.012)	0.372 (0.000)	0.313 (0.000)	0.250 (0.000)	1						
Arsons	0.633 (0.000)	0.121 (0.128)	0.062 (0.385)	0.203 (0.004)	0.279 (0.000)	0.624 (0.000)	1					
OC Index5	0.313 (0.000)	0.448 (0.000)	0.567 (0.000)	0.382 (0.000)	0.602 (0.000)	0.848 (0.000)	0.586 (0.000)	1				
OC Index ISTAT	0.333 (0.000)	0.207 (0.023)	0.071 (0.442)	0.341 (0.000)	0.444 (0.000)	0.573 (0.000)	0.931 (0.000)	0.596 (0.000)	1			
OC Index CRENOS	0.459 (0.000)	0.227 (0.004)	0.161 (0.023)	0.404 (0.000)	0.196 (0.013)	0.715 (0.000)	0.551 (0.000)	0.529 (0.000)	0.504 (0.000)	1		
OC Daniele Marani	0.432 (0.000)	0.288 (0.000)	0.339 (0.000)	0.319 (0.000)	0.477 (0.000)	0.771 (0.000)	0.912 (0.000)	0.841 (0.000)	0.914 (0.000)	0.506 (0.000)	1	
PCA OC Index5	0.313 (0.000)	0.764 (0.000)	0.929 (0.000)	0.464 (0.000)	0.398 (0.000)	0.436 (0.000)	0.189 (0.000)	0.622 (0.080)	0.160 (0.000)	0.262 (0.001)	0.404 (0.000)	1

**Table 1**  
**Summary Statistics**

Variable	Mean	Std Devt	Min	Max	Obs
<b>GDP p.c. growth (%)</b>	2.63	2.56	-3.95	11.63	257
<b>Initial GDP p.c. (1990 lire)</b>	18,900,000	8,068,528	4,165,179	39,000,000	257
<b>Investment (% GDP)</b>	24.81	6.68	15.81	71.55	240
<b>Education</b>	62.06	25.27	11.84	104.79	260
<b>Inflation (%)</b>	19.77	6.98	5.9	-4.52	260
<b>Population growth (%)</b>	4.06	3.67	0.12	16.01	257
<b>Public spending (% GDP)</b>	19.46	5.53	9.62	33.52	200
<b>Trade (% GDP)</b>	33.95	28.08	1.22	223.44	207
<b>Financial development (% GDP)</b>	20.03	3.33	12.29	27.54	140
<b>Corruption</b>	2.35	1.98	0.19	10.2	257
<b>Extortion</b>	5.29	3.55	0.89	19.03	200
<b>Criminal Association</b>	1.85	0.96	0.44	6	200
<b>Mafia Criminal Association</b>	0.3	0.5	0	2.95	160
<b>Homicides by Mafia</b>	0.24	0.71	0	6.73	200
<b>Arsons</b>	13.4	12.72	2.02	101.13	200
<b>Bomb Attacks</b>	2.37	4.28	0	24	160
<b>Robberies in Banks</b>	2.34	1.68	0	7.38	160
<b>Robberies in Posts</b>	1.16	0.96	0	6.81	160
<b>Kidnapping for extortion</b>	0.24	0.2	0	1.11	200
<b>OC Index5</b>	10.67	7.41	2.78	43.12	160
<b>OC Index ISTAT</b>	20.51	15.53	4	76.61	120
<b>OC Index CRENOS</b>	38.93	40.6	3.19	295.12	200
<b>OC Index Daniele and Marani</b>	25.95	18.62	7.44	124.78	160
<b>PCA OC Index5</b>	1.25	1.65	-1.48	8.2	160

*Notes: Data on GDP per capita growth, investment, inflation secondary school enrolment, trade, public spending, financial development and population growth are from CRENOS-Cagliari and the Italian National Institute of Statistics (ISTAT)- Annals of Statistics (different years). For these variables, summary statistics are based on average data for the period 1961-2009. Data on crimes are from ISTAT- Annals of Judicial Statistics (different years). The period of time considered for the averages depends on the availability of data (see Table A in Data Appendix for a detailed description of the availability of data).*

**Table 2**  
**Preliminary Findings**

	(1)	(2)	(3)	(4)	(5)
	FE	GMM	GMMS	GMMS1	GMMS2
loggdinitial	-3.787 [0.963]***	-1.056 [0.293]***	0.906 [0.589]	-0.162 [1.029]	0.324 [1.131]
Inflat	-0.111 [0.025]***	-0.137 [0.018]***	-0.185 [0.013]***	-0.216 [0.033]***	0.221 [0.033]***
Educ	0.030 [0.018]*	0.010 [0.007]	-0.022 [0.010]**	-0.032 [0.028]	-0.026 [0.029]
Invest.	0.122 [0.032]***	0.123 [0.022]***	0.407 [0.049]***	0.186 [0.040]***	0.178 [0.046]***
Corrup rate	-0.395 [0.138]***	-0.868 [0.150]***	-0.183 [0.106]*	-0.335 [0.155]**	-1.524 [0.477]***
corrhighoc	0.232 [0.133]*	0.438 [0.265]*	0.236 [0.072]***	0.547 [0.202]***	0.372 [0.158]**
Pop_Growth				0.083 [0.076]	0.052 [0.085]
Public Spending				-0.134 [0.056]**	-0.080 [0.062]
Trade				0.029 [0.011]***	0.026 [0.009]***
corrsq					0.136 [0.047]***
Constant	62.507 [15.086]***		-19.016 [10.018]*	6.270 [16.284]	0.956 [19.101]
Observations	225	206	225	177	177
R-squared	0.529				
F	37.492				
sarganp		0.000	0.001	0.000	0.000
hansenp		0.440	0.172	0.114	0.147
ar1p		0.000	0.000	0.001	0.001
ar2p		0.135	0.567	0.278	0.520
N_g	19	19	19	19	19
j		24	19	19	21
n.lags		2_5	2_3	2_2	2_2

Standard errors in brackets [\* p<0.10, \*\* p<0.05, \*\*\* p<0.01]

Notes: Dependent Variable is the GDP per capita growth rate. p-values in parentheses. Constant term not reported. All the control variables in difference and system-GMM are instrumented. Regressions based on fixed effects (Column 1), difference-GMM (Column 2), system-GMM (Column 3), system-GMM with additional control variables (Column 4), and system-GMM with additional control variables included corruption square (Column 5). The term Corruption\*HighOC is the interaction term between the measure of corruption and a dummy variable for the regions where the presence of OC is more widespread, which are: Sicily, Calabria, Campania, Puglia, Basilicata, Molise, Lazio and Liguria (classified on the base of data on Mafia criminal association, as defined by art. 416 bis of the Italian Penal Code).

**Table 3**  
**Benchmark Findings**

Panel A: Difference GMM					
	(1)	(2)	(3)	(4)	(5)
	GMMD1	GMMD2	GMMD3	GMMD4	GMMD5
loggdppinitial	-7.470	-6.288	-9.178	-8.866	-8.966
	[1.603]***	[2.909]**	[2.347]***	[2.091]***	[2.022]***
inflat	-0.369	-0.405	-0.482	-0.361	-0.423
	[0.036]***	[0.020]***	[0.039]***	[0.027]***	[0.029]***
educ	-0.038	-0.052	-0.066	-0.020	-0.033
	[0.018]**	[0.027]*	[0.022]***	[0.016]	[0.016]**
invest.	0.284	0.248	0.372	0.147	0.255
	[0.044]***	[0.043]***	[0.041]***	[0.039]***	[0.048]***
corrup rate	-0.297	-0.256	-0.394	-0.472	-0.635
	[0.074]***	[0.127]**	[0.146]***	[0.070]***	[0.100]***
OC Index	-3.082	-0.786	-0.220	-0.262	-0.140
	[0.353]***	[0.158]***	[0.090]**	[0.029]***	[0.032]***
Corr*OC Index	0.424	0.114	0.201	0.026	0.039
	[0.035]***	[0.025]***	[0.039]***	[0.004]***	[0.006]***
Observations	114	114	114	114	114
R-squared					
F					
sarganp	0.000	0.000	0.001	0.000	0.000
hansenp	0.338	0.256	0.258	0.256	0.239
arlp	0.005	0.003	0.004	0.003	0.002
ar2p	0.717	0.341	0.442	0.933	0.900
N_g	19.000	19.000	19.000	19.000	19.000
j	21.000	21.000	21.000	21.000	21.000
lags	2_4	2_4	2_4	2_4	2_4
Standard errors in brackets					
* p<0.10, ** p<0.05, *** p<0.01					
Panel B: System-GMM					
	(1)	(2)	(3)	(4)	(5)
	GMMS1	GMMS2	GMMS3	GMMS4	GMMS5
loggdppinitial	-1.600	-0.602	-1.204	-3.057	-1.728
	[0.848]*	[0.754]	[0.956]	[0.891]***	[1.202]
Inflat	-0.351	-0.386	-0.345	-0.322	-0.308
	[0.021]***	[0.027]***	[0.027]***	[0.026]***	[0.028]***
Educ	-0.079	-0.092	-0.080	-0.055	-0.053
	[0.008]***	[0.009]***	[0.013]***	[0.010]***	[0.014]***
Invest.	0.218	0.256	0.176	0.107	0.108
	[0.042]***	[0.048]***	[0.055]***	[0.039]***	[0.040]***
Corrup rate	-0.206	-0.196	-0.749	-0.367	-0.795
	[0.045]***	[0.063]***	[0.108]***	[0.073]***	[0.112]***
Mafia Ass. Rate	-2.045	-0.720	-0.522	-0.160	-0.126
	[0.285]***	[0.043]***	[0.074]***	[0.018]***	[0.021]***
corrmafiaassrate	0.316	0.143	0.210	0.017	0.039
	[0.050]***	[0.039]***	[0.021]***	[0.008]**	[0.005]***
Observations	133	133	133	133	133
R-squared					
F					
sarganp	0.000	0.000	0.000	0.000	0.000
hansenp	0.272	0.279	0.491	0.324	0.348
arlp	0.004	0.003	0.002	0.003	0.002
ar2p	0.244	0.133	0.841	0.147	0.250
N_g	19.000	19.000	19.000	19.000	19.000
j	22.000	22.000	22.000	22.000	22.000
lags	2_3	2_3	2_3	2_3	2_3
Standard errors in brackets					
* p<0.10, ** p<0.05, *** p<0.01					

Notes: Dependent Variable is the GDP per capita growth rate. p-values in parentheses. Constant term not reported. All the control variables are instrumented. Regressions based on Difference-GMM (Panel A) and System-GMM (Panel B). The measures of OC are as follows: Mafia crim. assoc. (Column 1); Mafia crim. assoc. + homicides by Mafia (Column 2); Mafia crim. assoc.+ homicides by Mafia + crim. assoc.(Column 3); Mafia crim. assoc.+ homicides by Mafia + crim. assoc.+ bomb attacks (Column 4); Mafia crim. assoc.+ homicides by Mafia + crim. assoc.+ bomb attacks+ extortion: OC Index5 (Column 5)

**Table 4**  
**Robustness of Benchmark Findings**

<i>Dependent Variable: GDP pc growth</i>	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Initial GDP per capita (log)	-1.73 (0.151)	-2.66 (0.165)	-0.65 (0.686)	-1.13 (0.325)	-2.33 (0.027)	-1.27 (0.321)	-0.96 (0.503)	-4.92 (0.366)
Inflation	-0.308 (0.000)	-0.333 (0.000)	-0.311 (0.000)	-0.342 (0.000)	-0.364 (0.000)	-0.115 (0.001)	-0.331 (0.000)	-0.491 (0.000)
Education	-0.053 (0.000)	-0.044 (0.021)	-0.039 (0.055)	-0.039 (0.014)	-0.042 (0.079)	-0.047 (0.003)	-0.053 (0.008)	-0.039 (0.526)
Investment	0.108 (0.007)	0.219 (0.000)	0.239 (0.000)	0.268 (0.000)	0.214 (0.000)	-0.012 (0.822)	0.223 (0.000)	0.212 (0.183)
Corruption	-0.795 (0.000)	-0.813 (0.000)	-0.848 (0.000)	-0.851 (0.000)	-0.812 (0.000)	-0.330 (0.001)	-0.796 (0.000)	-3.433 (0.032)
Organized Crime	-0.126 (0.000)	-0.102 (0.018)	-0.195 (0.040)	-0.167 (0.000)	-0.167 (0.000)	-0.148 (0.001)	-0.144 (0.001)	-0.779 (0.039)
Corruption*Organized Crime	0.039 (0.000)	0.036 (0.000)	0.051 (0.000)	0.054 (0.000)	0.051 (0.000)	0.020 (0.020)	0.045 (0.000)	0.250 (0.054)
Population Growth			0.31 (0.021)	0.16 (0.169)	0.159 (0.112)	0.261 (0.001)		
Public Spending				-0.163 (0.003)	-0.164 (0.001)	0.050 (0.326)		
Trade					0.009 (0.298)	-0.016 (0.061)		
Financial Development						0.164 (0.043)		
Corr*OC*80s							0.019 (0.437)	
Corr*OC*90s							0.000 (0.931)	
Corr*OC*Campania								-0.069 (0.246)
Corr*OC*Calabria								-0.074 (0.213)
Corr*OC*Sicilia								-0.073 (0.169)
Corruption*OC*Puglia								0.019 (0.926)
Corruption*OC*Basilicata								0.064 (0.425)
Corruption*OC*Molise								-0.104 (0.210)
Corruption*OC*Lazio								-0.255 (0.401)
Corruption*OC*Liguria								0.246 (0.191)
Regions/Obs	19/133	19/133	19/133	19/133	19/130	19/111	19/133	19/134
Number of instruments	22	15	17	19	21	23	18	31
Hansen J-test (p-value)	0.348	0.072	0.079	0.074	0.103	0.666	0.077	0.778
AR(1) test (p-value)	0.002	0.003	0.008	0.004	0.009	0.006	0.003	0.001
AR(2) test (p-value)	0.25	0.572	0.276	0.322	0.419	0.317	0.368	0.234
No. of lags of endogenous variables	2_3	2_2	2_2	2_2	2_2	2_2	2_2	2_2

*Notes: Dependent Variable is the GDP per capita growth rate. p-values in parentheses. Constant term not reported. All the control variables are instrumented. Regressions based on System-GMM. OC measured by our baseline index (OC Index5: Mafia crim. assoc. + homicides by Mafia + crim. assoc. + bomb attacks+ extortion).*

**Table 4 b**  
**Robustness of Benchmark Findings**

Robustness of Benchmark Findings			
	(1)	(2)	(3)
	GMMS5	GMMS6	GMMS7
loggdpinitial	-1.728 [1.202]	-2.806 [1.125]**	-3.608 [1.548]**
Inflat	-0.308 [0.028]***	-0.396 [0.025]***	-0.349 [0.041]***
Educ	-0.053 [0.014]***	-0.056 [0.011]***	-0.018 [0.021]
Invest.	0.108 [0.040]***	0.120 [0.035]***	0.216 [0.062]***
Corrup rate	-0.795 [0.112]***	-0.757 [0.095]***	-1.768 [0.476]***
ocindex34new	-0.126 [0.021]***	-0.138 [0.021]***	-0.151 [0.051]***
corrOC34new	0.039 [0.005]***	0.034 [0.006]***	0.023 [0.012]**
lag_gdppcgrowth		0.259 [0.034]***	
corrsg			0.116 [0.064]*
Observations	133	133	133
R-squared			
F			
sarganp	0.000	0.000	0.000
hansenp	0.348	0.320	0.289
arlp	0.002	0.001	0.008
ar2p	0.250	0.108	0.735
N_g	19	19	19
j	22	22	17
lags	2_3	2_3	2_2
Standard errors in brackets			
* p<0.10, ** p<0.05, *** p<0.01			

Notes: Dependent Variable is the GDP per capita growth rate. p-values in parentheses. Constant term not reported. Regressions based on System-GMM. OC measured by our baseline index (OC Index5: Mafia crim. assoc. + homicides by Mafia + crim. assoc. + bomb attacks+ extortion).

**Table 5**  
**Robustness to Alternative Measures of OC**

<i>Dependent Variable: GDP pc growth</i>	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	<i>OC Index5</i>	<i>MA+HM+BA+Ar</i>	<i>OC5+Ars.</i>	<i>OC5+KE</i>	<i>OC5+Ars+KE</i>	<i>Daniele and Marani(2010)</i>	<i>ISTAT Caruso (2008)</i>	<i>Index 1961-2009</i>
Initial GDP per capita (log)	-1.73 (0.151)	-1.62 (0.185)	-2.66 (0.000)	-2.37 (0.001)	-1.92 (0.001)	-1.95 (0.001)	-1.98 (0.002)	-1.97 (0.025)
Inflation	-0.308 (0.000)	-0.306 (0.000)	-0.316 (0.000)	-0.316 (0.000)	-0.324 (0.000)	-0.325 (0.000)	-0.257 (0.000)	-0.177 (0.000)
Education	-0.053 (0.000)	-0.053 (0.000)	-0.031 (0.002)	-0.036 (0.011)	-0.041 (0.002)	-0.042 (0.001)	-0.07 (0.000)	0.004 (0.691)
Investment	0.108 (0.007)	0.106 (0.009)	0.048 (0.424)	0.097 (0.008)	0.083 (0.104)	0.09 (0.057)	0.056 (0.215)	0.204 (0.000)
Corruption	-0.795 (0.000)	-0.809 (0.000)	-0.811 (0.000)	-0.761 (0.000)	-0.769 (0.000)	-0.752 (0.000)	-0.281 (0.057)	-0.551 (0.000)
Organized Crime	-0.126 (0.000)	-0.12 (0.000)	-0.076 (0.000)	-0.044 (0.000)	-0.045 (0.000)	-0.042 (0.001)	-0.04 (0.015)	-0.029 (0.000)
Corruption*Organized Crime	0.039 (0.000)	0.039 (0.000)	0.014 (0.000)	0.009 (0.000)	0.01 (0.000)	0.009 (0.000)	0.006 (0.049)	0.007 (0.000)
Regions/Obs	19/133	19/133	19/133	19/133	19/133	19/133	19/114	19/171
Number of instruments	22	22	22	22	22	22	22	22
Hansen J-test (p-value)	0.348	0.347	0.280	0.284	0.246	0.257	0.548	0.360
AR(1) test (p-value)	0.002	0.002	0.002	0.002	0.002	0.002	0.008	0.000
AR(2) test (p-value)	0.250	0.262	0.470	0.506	0.505	0.513	0.087	0.203
No. of lags of endogenous variables	2_3	2_3	2_3	2_3	2_3	2_3	2_3	2_3

*Notes: Dependent Variable is the GDP per capita growth rate. p-values in parentheses. Constant term not reported. All the control variables are instrumented. Regressions based on system-GMM. OC is measured as follows: baseline index: OC Index5 (Column 1); Mafia association+ homicides by Mafia+ bomb attacks +arsons (Column 2); OC Index5+arsons (Column 3); OC Index5+kidnapping for extortion (Column 4); OC Index5+arsons+kidnapping for extortion (Column 5); OC index proposed by Daniele and Marani (2010): extortion +bomb attacks +arsons +criminal association + Mafia criminal association (Column 6); ISTAT OC index: homicides by Mafia+ bomb attacks+ arsons+ "serious robberies" (Column 7); OC index which includes: "serious robberies"+kidnapping for extortion+ extortion (Column 8).*