CORRUPTION, COMPLEXITY AND GOVERNANCE: THE ROLE OF TRANSPARENCY IN HIGHLY COMPLEX SYSTEMS

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Abstract

This paper draws on the available interdisciplinary literature on corruption. We describe corruption as a highly complex phenomenon, which includes heterogeneous elements with nontrivial relationships, unpredictable evolution and changing dynamics. We conclude that anticorruption efforts must be aware of this complexity and include the needed governance instruments. Self regulation, transparency and ethics are called on to play a fundamental role.

Keywords: Corruption, Complexity, Governance, Ethics

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Introduction

Countries and international agencies acknowledge the insidious economic and social effects of corruption. Scholars do not remain oblivious to the problem. The topic has been visited and revisited from political science, economics, sociology, law or ethics. While scholars produced a growing body of research and greatly enhanced the general knowledge about corruption, international agencies and countries exponentially increased the amount of funds, instruments and legal initiatives to fight corruption. Unfortunately, the theoretical and empirical success has been scarce.

The World Bank recognizes that in average, improvements mostly stagnated (WBG, 2006). Designed tools go largely unrealized in many areas such as anti-money-laundering (Sharman and Chaikin, 2009) bureaucracy quality, incentives to bribery or controls (Dollar, Hallward-Driemeier & Mengistae, 2005). In the academic arena, authors recognize research is not providing a true comprehension of the phenomenon (Goudie & Stavage, 1997) and "investigation into causes, consequences and 'cures' to corruption is still in its infancy" (Kaufmann, 1998: 141-142).

While a growing consensus emphasizes the need for re-invent anti-corruption policy, discussion turns around systems and instruments (Bardhan, 2006). Two proposals can be distinguished. On the one hand, international agencies, a section of Management science and other no-economic social science are convinced that "governments alone cannot contain corruption" (UN, 2004: 17), proposing a strategy of governance is presented. On the other, economists, who are convinced that reform should necessarily focus on combating judicial and administrative corruption. Thus, they propose an optimal law enforcement through appropriate incentives and punishment (Rose-Ackerman, 1978).

Drawing on the available interdisciplinary literature on corruption, this paper attempts to contribute to the debate adding a new element: the complexity. We suggest that literature has failed to capture the complexity of the corruption being essential.

Despite scholars (Michael, 2004; Argandoña, 2003; Jain, 2001; Ades & Di Tella, 1997) have imputed the lack of performance in anti-corruption policies to an inappropriate approach, corruption has been conceptualized as a complicated puzzle that can be solved with traditional regulatory models from public administration science, since its pieces could be analyzed as independent elements. However, corruption is not a complicated problem but rather an extremely complex phenomenon, which shows all the characteristic features of complex adaptive systems. This call has a direct and important practical implication because as a complex phenomenon, corruption largely resists traditional regulatory models.

The remainder of this article is structured as follows. After briefly summarizing the background of the "demand for governance" and "optimal enforcement", the next section describes corruption as a complex phenomenon. We distinguish between complicated problems and complex phenomena, with theoretical and practical arguments. Then, we detail the complex nature of corruption as stemming from heterogeneous elements connected through non-trivial relationships, which form a system with its own evolution and dynamics. That leads us to underline the bounded capacity of current regulatory strategies to handle such complexity in an effective way. The last part of the article argues for the potential benefits of new governance instruments. After differentiating between horizontal and vertical instruments, we suggest that ethics may be the principal element in a successful vaccine for corruption.

Governance vs optimal law enforcement

Governance refers to a "new method by which society is governed" (Rhodes, 1996). Its popularity is derived

"from its capacity —unlike that of the narrower term 'government'— to cover the whole range of institutions and relationships involved in the process of governing" (Pierre & Peters, 2000: 1). Governance is an essentially self-organizing and coordinating network of societal actors (Jordan et al, 2006). Thus, the essence of the transition from government to governance is the simultaneous participation of private and public actors (Stoker, 1998). In a governance strategy, traditional government instruments —regulatory activity based on legal rules, procedures and administrative and judiciary sanctions—, which keep their importance, are complemented by private actors with other instruments, like soft law, co-regulation, self-regulation or voluntary agreements.

Under the hypothesis that voluntary principles and standards of conduct may be economically viable, operationally feasible and socially profitable, new governance instruments are extending their presence in some realms, sectors and countries.

This view is extending to anti-corruption efforts, moving the monopoly of traditional interventionist policy instruments. It promotes some delegation of authority suggesting that in order to curb corruption "a free media, vibrant civil society, engaged local communities and an independent middle class are crucial components for good governance… wider engagement with the domestic private sector and multinationals is required" (WBG, 2006: 12-13).

The argument explains that, embedded in the winds of globalization change, old anti-corruption and traditional government instruments policies result imperfect, incomplete and ineffective (Jordan, Wurzel & Zito, 2006). Private sector and the civil society should emerge as key pillars of integrity (UN (2004) proposing strategies for strengthening "good governance"

Governance is already popular in subjects such as environmental policy, in which the regulatory activity is shifting from traditional command-and-control orientation toward market instruments and private self-regulation, reaping important success. The question is if this view —which is still a declaration of goodwill because the "next generation of governance strategies" is often left uncompleted (Coleman & Perl, 1999)— could or must extend to anti-corruption area and then to solve how choose effective and efficient instruments to involve both public and private actors in the implementation of a policy (Howlett & Rayner, 2006) and how to engage national states if old principles of regulatory government and new modes of governance when conflict exist (Eberlein & Kerwer, 2004).

The second proposal becomes from economic science. Identifying corruption as a symptom of dysfunctional governance within the public sector or as a behavioural phenomena between state and market (Rose-Ackerman, 1978; Mauro,1995), economists demand institutional quality. They underline the need for appropriate incentives and punishment (Glaeser & Shleifer, 2003).

We share partially this opinion, but we must go far beyond. An integrated approach is needed, but previously a correct dissection of corruption must be realized. In this paper, we describe corruption as a highly complex phenomenon, which includes heterogeneous (political, social, cultural and economic) elements with nontrivial relationships, unpredictable evolution and changing dynamics. This is particularly important because complexity resists regulation and requires governance.

This paper suggests that, in curbing corruption, the adoption of governance instruments, especially business ethical self-regulation, is not an option but a requirement. Our central argument is built on corruption's nature. After drawing largely on the existing literature, we must conclude that corruption has been viewed as a complicated puzzle that can be solved with traditional regulatory models from public administration science, since its pieces could be analyzed as independent elements.

We argue that this framework is severely flawed. Corruption is not a complicated problem but rather an extremely complex phenomenon, which shows all the characteristic features of complex adaptive systems. This theoretical call has a direct and important practical implication because as a complex phenomenon, corruption largely resists regulatory models, calling for governance and specifically for ethics.

Governance and government instruments

In strictest sense, governance refers to a "new method by which society is governed" (Rhodes, 1996: 653). Its popularity is derived "from its capacity —unlike that of the narrower term 'government'— to cover the whole range of institutions and relationships involved in the process of governing" (Pierre & Peters, 2000: 1). Governance is an essentially self-organizing and coordinating network of societal actors (Jordan, Wurzel & Zito, 2006). Thus, the essence of the transition from government to governance is the simultaneous participation of private and public actors (Stoker, 1998). In a governance strategy, traditional government instruments —regulatory activity based on legal rules, procedures and administrative and judiciary sanctions—, which undoubtedly keep their importance, are complemented by private actors with other instruments, like soft law, co-regulation, self-regulation or voluntary agreements.

New governance instruments are extending their presence in some realms, sectors and countries. For instance, they are already popular in environmental policy, in which the regulatory activity is shifting from traditional command-and-control orientation toward market instruments and private self-regulation (Howlett & Rayner, 2006; Pierre, 2000).

This view is extending to anti-corruption efforts, moving the monopoly of traditional interventionist policy instruments. It is now suggested that in order to curb corruption "a free media, vibrant civil society, engaged local communities and an independent middle class are crucial components for good governance… wider engagement with the domestic private sector and multinationals is required" (WBG, 2006: 12-13).

However, even if governance is theoretically present, it has diffuse and weak implementation or

conviction and anticorruption strategies retain regulations and traditional controls as their key pieces.

A few examples will shed some light. The Governance and Anti-corruption Report of the WBG explicitly recommends the introduction of traditional "public sanctions to raise the cost to businesses to engage in corruption" (WBG, 2006: 13), forgetting other new softer-instruments, such as voluntary agreements or self-regulations, that the WGB itself has presented in certain forums Recognizing the adverse impact of corruption on economic efficiency and growth, "the IMF has turned its attention to a broader range of institutions reforms and governance issues in the reform programs it supports" (Wolf & Gürgen, 1996: 2-3). Despite this declaration, measures in this area (lifting price controls, opening up the trade system, elimination of exchange controls or privatisation of public enterprises) have been mostly related to the reduction of the government's size, without any engagement of the private sector.

The creation of positive interactions among implicated agents, especially private actors, in order to design a new process of governing where government and private instruments work together is still a declaration of goodwill which needs much further development. In fact, its practical implementation presents three main problems: (1) how to involve private actors in the anticorruption policy formulation; (2) how to obtain the involvement of both public and private actors in the implementation of policy; and, finally, (3) how to engage national states if old principles of regulatory government and new modes of governance could compete and conflict with each other (Eberlein & Kerwer, 2004). The first two difficulties require careful analysis in order to choose effective and efficient instruments (Howlett & Rayner, 2006) for formulation and implementation (WBG, 2006).

The third one is not simpler. To the question "has governance eclipsed government?", some authors (Jordan et al., 2006) suggest an inertia which comes from both a certain resilience of regulation — regulation is often very hard to eliminate— and some risk in the alternatives — the design of the "next generation strategies" is often left uncompleted (Coleman & Perl, 1999)-.

Corporate scandals have been dealt with from the traditional government perspective (that is, new regulations) and not from the governance paradigm. We suggest that this is a strategic error since the complex nature of corruption eludes simplistic solutions.

The situation in the academic arena

The situation in the academic arena is similar; governance gains some theoretical relevance but most attention is still devoted to government instruments.

Corruption and complexity

Most scholars and experts have repeatedly recognized that corruption is far from simple. Moreover, in international institutions and national governments, the mention of corruption as a complex issue turns out to be not an exception. For instance, in his two interventions on corruption at the 2006 IMF/World Bank Group Annual Meeting, former president Wolfowitz expressly indicated that corruption is extremely complex and as such it must be fought. Like him, academia has unanimously certified that corruption is a very difficult construct, born and developed in complexity (Batty & Torrens, 2005; Collier, 2002; Klitgaard, 1988; Rose-Ackerman, 1999; TI, 2004).

Complexity has been signaled as a main impediment to offering a compact and systematic framework for corruption. (Aidt, 2003; Argandoña, 2001; Bac, 1998; Davis & Ruhe, 2003). It could explain differences in anticorruption results across countries (Gaviria, 2002); the intricacy of legal enforcement of international contracts (Lambsdorff, 2002); or even the lack of a precise and comprehensive definition (Johnston, 2000), which is far from being just a semantic issue, since a concept's definition determines what gets modeled and what is empirically tested (Aidt, 2003).

Complexity seems to rear its head in all corruption-related issues. Some authors qualify the effect of corruption on cross-border investment as a very complex one (Rose-Ackerman, 1999). Complexity is included as a key factor on the individual decisions to engage in corruption (Guerrero & Rodríguez-Oreggia, 2008). The relationships between corruption and the effectiveness of a country's legal system are defined as affected by complexity (Jain, 2001). The complex connections between corruption and the rule of law are also pointed out in the literature (Herzfeld & Weiss, 2003). Even the inner complexity of bureaucratic processes is highlighted (Buscaglia, 2001).

Although complexity is signaled as a factor that favors corruption (Lambert-Mogiliansky; 2002), its nature has been rarely examined. In many cases, the term itself remains undefined. In order to adopt a systematic and consistent treatment of governance issue across countries, the mere affirmation that corruption exhibits a high degree of complexity is not enough. Science must also be able to comprehend the nature of that complexity. The success in dealing with that challenge has been marginal.

Complexity has not always functioned as a spur for wide and interdisciplinary efforts. On occasions, the effect of integrating complexity into anti-corruption programs has been the "despair and resignation on the part of those who are concerned about it" (Bardhan, 1997: 1321). In other instances, different procedures have been applied trying to reduce complexity. Too frequently, the procedure has consisted in increasing mathematical sophistication and reducing the systemic view, producing stylized studies without practical applications. Unfortunately, in most attempts to understand, predict and develop courses of anticorruption action, strategies applied by international organizations and countries participate in this mainstream.

Those procedures do not exhibit an adequate understanding of the theoretical framework of complex systems. They have implicitly confused complex and complicated problems. Corruption, which is an extremely complex problem, has been treated as a complicated one.

From complicated problems to complex phenomena

The essential difference between complicated and complex problems is that the former can be reduced to a set of simple cause-effect problems, so that its complicated nature often rests on the scale. Its reduction to a set of problems would permit to combat corruption with a set of regulations focused on the set of single causes. Of course, this is not to mean that the solution for complicated problems is guaranteed to exist. It only means that the way of tackling complicated problems is different from the way of dealing with complex problems

Complex problems cannot be reduced to an assembly of simple components (Goodwin, 1994) because some special features are present, like the need of understanding unique local conditions, interdependency (Holland, 1995) non-linearity or non-triviality (Lorenz, 1993), capacity to adaptation and novelty as conditions change (Kauffman, 1995). Even if uncertainty is associated with both complicated and complex problems, the former, whose major difficulty is coordination, can be approached with greater degree of optimism than complex problems.

The literature on corruption has reduced the issue to an assembly of simple political (Caselli & Morelli, 2004), commercial (Rose-Ackerman, 1999) or behavioral relationships, susceptible of aggregation (Kaufman, 1998; TI, 2000;) and solvable through regulations and control-and-command instruments. Solutions that are wedded to trivial and static approaches have been consequently applied.

For instance, in a large number of occasions, it has been suggested that corruption = poor governance, identifying corruption as a complicated problem of governance weakness, which can be fought with the adoption of a host of independent policies We suggest that this view is incorrect. If corruption was a complicated problem of governance weakness, the current knowledge of simple and independent cause-effect relationships would eventually be enough to solve it (Rodriguez, Uhlenbruck, & Eden, 2005). We argue that corruption often takes forms more complex and subtle than simple transactions and as a result the complexity perspective —which discards the aggregation methodology— is needed (Aidt, 2003; Michael, 2004;).

The nature of corruption as an 'extremely complex phenomenon' must be understood, internalized and added to models and strategies, in order to ensure the systematic, integrated and consistent treatment of governance and anticorruption measures.

The Incorporation of Complexity

In spite of its intricate nature, the interest in complexity —traditionally circumscribed to natural sciences— has largely extended across other academic disciplines since 1996. The profound recognition that the world is complex has led both economics and management science to accept that "economic organization is formidably complex and economic agents are subject to very real cognitive limits" (Williamson, 1996: 311).

In recent years, the description of the firm as a 'complex adaptive system' (Foster, 2005) with dynamic efficiency (Loasby, 1998) or the view of economics as 'self-organization', have received considerable attention.

In the context of literature on economics and politics, implications of complexity have affected certain academic topics, such as the law and economics of contracts (Eggleston et al, 2000), international negotiation strategies (Kumar et al, 2005), business cycles (Grandmont, 1985), asymmetric information models or choice theory (Brock & Durlauf, 1995).

The literature on corruption has not incorporated complexity. Theories and models were dominated by the view that we could simplify and distil the essence of things by decomposition and aggregation.

More oriented to forecasting than to understanding, this dominant framework has tested hypothetical linear connections between a specific cause in the environment, and a specific effect - a part of the system-. Thus, corruption is tackled as an aggregation or set of linear problems which operate in a state of stable equilibrium.

This dominant approach has been successful in offering many and important advances in the knowledge of the simple cause-effect relationships between corruption and many other variables. Through mathematical and statistical analysis, it has derived the basic properties of each linear connection and tested its hypotheses using cross-sectional data. Moreover, experts believe their conclusions are enough to identify —not totally but largely— the environmental changes that must be carried out and therefore have restructured the available strategies in these theoretically predictable ways (Zajac & Kraatz, 1993). In consequence, anticorruption strategies can be described as a natural reaction to an increasing amount of theoretical evidence.

However, those theoretical linear relationships have turned out to be ambiguous, weak and contradictory in their empirical applications. Finally, applied strategies —such as privatizations- have failed to provide a cross-national satisfactory reduction in corruption levels. The recent evolution of transition economies expresses that confusion (Li, 2004)

We suggest that for corruption, the knowledge of simple and independent cause-effect relationships is not enough (Aidt, 2003). Corruption is not a complicated chain of independent events, which may be aggregated around a set of linear cause-effect relationships. Corruption is a phenomenon. If we expect to develop efficient anticorruption systems, the lens of complexity science are needed.

Generators of Complexity

When referring to governance and anticorruption, few researchers explicitly advocate for applying the complexity perspective. The quality of being complex is not easily described. It is a special attribute that refers to many diverse aspects and its whole analysis largely exceeds the goals of this article1. However, in the vast number of interdisciplinary studies and proposals referred

to the complex reality, scholars have identified some 'generators' of complexity (Richardson, 2005), whose presence increases the uncertainty and, therefore, the difficulty of decision-making.

In the realm of economics and organizational science (Brian, Durlauf, & Lane, 1997), authors suggest that complexity presents at least four main "generators":

a. The number of heterogeneous elements in the system (Cilliers, 2005; MacLeod & Pingle, 2005). A greater number of elements and a higher level of heterogeneity among them increase the complexity.
b. The non-trivial interaction among heterogeneous elements (Marengo & Dosi, 2005). Trivial relationships are simpler than non-linear or multi-causal relationships.
c. Continual adaptation to environmental changes by learning and evolving elements (Simon, 2002). Evolution produces surprising behavior of the system, which increases the complexity (Michael, 2004).
d. Perpetual novelty (Batty & Torrens, 2005; Day, 1994; Kaufmann, 1995), which creates new complex structures.

The verification of the presence or absence of the above complexity generators in corruption should permit us to bring out its nature. With this perspective, we have carried out an exhaustive interdisciplinary revision of the available literature. We conclude (and state four hypotheses) that the factors above are present in corruption:

Elements that Define Corruption

Literature has recognized that corruption is

a. A many-faceted (Aidt, 2003) and multidimensional (Von Alemann, 2004) phenomenon. Focusing on both causes and consequences (Kaufman, 1997; Mauro, 1998; Treisman, 2000), analyses suggest that corruption depends upon (and has effects on) a host of factors.
b. Differences among factors support the heterogeneity hypothesis, so that corruption must be tackled as a multidisciplinary phenomenon (Jain, 2001; Michael, 2004) related with many different features coming from politics, economics or law and depending on countries' culture, sociology or ethics. This is a new and very important step that explicitly recognizes that those heterogeneous dimensions interact in various and complex ways (Gaviria, 2002).

Because of (a) we have a large juxtaposition of elements, which may present complicated links, but not necessarily complexity. Because of (b) we have a system, that is, many forces working behind the scenes which interact forming a whole phenomenon called corruption (Backlund, 2000). The whole —corruption— cannot be divided into independent parts and its dynamics cannot be described through the dynamics of its elements.

Corruption is a system and, therefore, systemic descriptions represent the only way to a correct understanding. This is expressed as:

H1: *The phenomenon of corruption presents a systemic structure formed by a high number of heterogeneous elements*

The analysis of a systemic structure includes two main phases: the description of the structure—in which the insider heterogeneous elements are listed— and the description of its dynamics.

System's structure. The description of what elements get modeled and measured depends on the adopted definition. This is a problem because one of the more important objectives of the anticorruption effort has been to offer a unifying definition of corruption (Senturia 1931; Tanzi, 1998). From the seminal definition (Senturia, 1931) in the Encyclopaedia of the Social Science —"the misuse of public office for private gain"—, most authors confess that there are many problems in the common use of terms (Bardhan, 1997). Problems are so hard that it results difficult "to define (corruption) in terms that are clear and universally valid" (Argandoña, 2003: 255). Indeed, "everyone that writes about (corruption) first tries to define it" (Jain, 2001: 104).

In order to avoid this problematic question, we will not employ a definition but exclusively a list of the necessary elements. Literature on corruption across disciplines (Bardhan, 1997) accepts2 that three key features are present in every corrupt transaction (Jain, 2001; Klitgaard, 1988):

(1) the opportunity: a discretionary power over the allocation of resources;

(2) the profit: rents associated with its misuse and

(3) the risk: probability of evading regulations/penalties associated with the wrongdoing

Following this view, we can make a qualitative picture of corruption's elements.

Opportunity: the discretionary power

In modern societies, delegation of some power is assumed as a needed element for performance and efficiency. Both economic organizations and public institutions are complex team-productions. By essence and structure, they are obligated to delegate to some persons specific tasks, including the power over the allocation of resources. Because in complex societies both knowledge and information are distributed in an asymmetric way, some autonomy —a discretionary power— over the allocation of the resources is on the agent's hands (Giddens, 1983).

Under the often reasonable assumptions that, in complex organizations, contractual designs of monitoring and compensation systems (Prendergast, 1999) are not totally efficient, the discretionary power creates a potential space of opacity. Under the equally reasonable assumptions that differences of interests may exist (Jensen & Meckling, 1976; Williamson, 1999) and honesty may often be low (Casdelli & Morelli, 2004), the agent's autonomy may create a potentially risky space of opacity. And corruption flourishes behind opacity.

The literature suggests that this space of opacity and its consequences may be more or less damaging for the

general welfare depending on the design of the power delegation systems in both the container —weak institutions— and the content —weak policies— (Johnson, Boone, Breach, & Friedman, 2000).

1.1.- Weak institutions

Researchers have described corruption as one of the negative effects of weak institutional designs (Mauro, 1995; Rose-Ackerman, 1999; Wei, 2000, 2001). The weaknesses come from both political processes and rules of the socioeconomic game, which are united to the form and method of delegation (Kitgaard, 1988).

In general terms, the literature has mostly shown that a stable democratic system has a lower risk of corruption than a dictatorship or an unstable democracy (Sung, 2004). In relation with political processes, competition and participation (Ades & Di Tella, 1999; Bliss & Di Tella, 1997; Mendez & Sepulveda, 2006), stability (Fredriksson & Svensson, 2003), high education (Hauk & Sáez-Martí, 2002), political rights (Ades & Di Tella, 1997), free press (Brunetti & Weder, 2003), high levels of civil monitoring (Kaufmann, 1997), etc. appear as contributing to a democracy's success and, thereby, their absence represents an opportunity for corruption. Although caution is suggested because, given a legal system, this factor itself can not explain the difference in corruption levels between regions, some studies find empirical evidence that more long-standing democracies are less corrupt (Treisman, 2000).

In relation with the rules of the game, no property rights (Acemoglu & Verdier, 2000), no contract enforcement and the absence of efficient, politically and financially independent anti-corruption agencies (Doig, 1995) tend to be related with higher levels of corruption.

1.2.- Weak policies

Certain designs of public services could also provide rich opportunities for corruption to prosper. Corruption can be seen as the most prominent example of an illegal and opaque exchange between the political/administrative market and the economic/social market intended for personal gain (Ades & Di Tella, 1997).

On the political/administrative hand, efficient designs of regulations have been investigated in order to address reforms that seek the rationalization of public service —including the simplification and reduction of bureaucratic power by promoting greater accountability and transparency (Everett, Neu & Shiraz, 2007), competition (Ades & Di Tella, 1999) and incentives (Van Rijckeghem & Weder, 2001); the desire to replace economic state powers with market mechanisms (Clarke & Xu, 2002) or decentralization (Fisman & Gatti, 2002; Tanzi, 1995).

On the economic/social hand, the weak design has been analyzed in relation with the functioning of economic forces in an environment in which a large amount of resources are administered by the state. There is evidence that corruption is associated with more unofficial activity and weak market rules (Friedman et al, 2000). Its performance has been studied in certain states of "corruption's development", related with the number and size of players —'market' and 'parochial' corruption3—, their mutual relationships —collusion or non-collusion systems (Bardhan, 1997; Foellmi & Oechslin, 2007, Rose-Ackerman, 1999)—, the behavioral attitudes of both parties of corrupt contract (Guerrero & Rodríguez-Oreggia, 2008), the asymmetry among the players or the source of the rent, etc.

1. Profit: the extraction of rents.

A weak and inefficient public sector may offer some discretionary and opaque power, which itself is an opportunity for corruption. However, corruption is a calculative crime, not a crime of passion (Klitgaard, 1988). In the decision to bribe or to accept being bribed, both the profit —rent-seeking behavior— and the cost play a principal role.

Corruption is associated with scenarios where the extraction of economic rents for private gain is available (Friedman et al, 2000). In those scenarios, rent-seeking bureaucrats who distribute commodities may take bribes; and governments who allocate commodities at low prices diverting public funds may extort firms or may be extorted by corporations looking for government benefits and/or costs avoidance (Wu, 2005).

Several studies have found cross-country evidence on the connection between corruption and higher rents coming from active industrial policy and low degrees of openness (Ades & Di Tella, 1997, 1999; Wei, 2000;). Trade restrictions (Mauro, 1998), favoritism in industrial policy such as subsidies and tax deductions (Sanyal, Gang, & Goswami, 2000) price control and government-controlled provision of credits are some of the underlined factors which permit the capture and extortion in public purchases (Auriol, 2006).

2. Risk: penalties and sanctions

Corrupters calculate both costs and profits. Corruption exposes the agent to the legal penalty system. As an unethical activity, it is also open to social sanctions. Both costs are very different across countries; these differences could be stressed as a source of variation in corruption levels across countries.

In relation with the legal penalty system, a poorly-functioning judiciary is an incentive for corruption. Where the system has no penalties or where it presents leniency (Buccirossi & Spagnolo, 2006) because the law is not applied or has not effect at all, the cost of crime will be low, so that attractiveness for the rational corrupter increases.

In that sense, two policies have been extensively considered: the rationalization of sanctions (Bowles & Garoupa, 1997) and the rationalization of incentives for enforcers, such as paying rewards (Becker & Stigler, 1974).

In relation with social penalties, sociology and comparative economics suggest that institutional efforts against corruption are always incomplete strategies (Banerjee, 1997) if socio-cultural factors are not included. Socio-cultural factors have to do with attitudes toward corruption.

In this line of reasoning, religious tradition (La Porta et al, 1997; Treisman, 2000); civil vs. common law systems (Treisman, 2000); or individualism vs. collectivism (Husted, 1999) have been directly examined. High corruption levels have also been related with inequality (You & Khagram, 2004) and low economic

growth, but there appears to be a vicious circle because poor countries tolerate corruption better than rich countries.

The behavior of corruption's system: A systemic structure formed by a high number of heterogeneous elements would be complicated but possible to cope with if interactions among those elements were trivial and easy to be recognized. If that was the case with corruption, after identifying the systemic elements, the parochial re-design of the environment should be trivial.

Even though a large number of corruption models have accepted the triviality hypothesis, it does not seem to be the most appropriate. There is evidence suggesting that relationships between corruption and factors which theoretically create attractive opportunities for corruption tend to be non-trivial.

This is expressed in our second hypothesis:

H2: *Relationships among elements are essentially non-trivial interactions*

When modeling and understanding corruption, several serious complications are encountered since relationships among the system's elements are non-trivial.

a) Causal connections

There is evidence enough to suggest that some of the important relationships described around corruption are two-way causal connections. For instance, from the seminal work on the subject (Mauro, 1995), a large number of empirical cross-country studies has appeared to prove a negative relationship between corruption and income. Corruption would harm growth by reducing the incentives to invest. This distorts the allocation of resources, leading to underinvestment and poor growth rates.

However, others have shown that corruption seems to be itself a function of income. There is a reverse causal relation so that environments of poverty are likely to generate corruption (Mendez & Sepulveda, 2006). Its incidence is directly affected by economic wealth because of the greater anticorruption budget of rich countries. The impact of income on corruption is visible in other ways. For example, corruption seems an important impediment for FDI in developed economies, but not that much in developing countries (Egger & Winner, 2006).

Bureaucratic malpractice influences but is also influenced by the level of development (Blackburn et al, 2006). The same circular effect occurs in relation with reforms (Tavares, 2007). It is not clear whether the institutional lack of quality favors corruption or the other way around (Guerrero & Rodríguez-Oreggia, 2008). Two-way causality has been also detected between corruption and poverty, foreign aid and inequality (Tavares, 2003 ,You & Khagram, 2004).

b) Endogeneity

The existence of problems at the moment of identifying the causal direction and deciding what variables will be utilized as instruments is obviously crucial from an empirical perspective. If those problems are not controlled, results can not be trusted. If the dependence between explanatory variables and the explained variable creates a circular causality relationship, a problem of endogeneity for any econometric approach to the issue emerges.

In fact, many of the corruption models suffer from potential endogeneity. Endogeneity has been detected, for instance, between red tape and corruption (Guriev, 2004); corruption and income (Cole, 2007; Mauro, 1995); corruption and competition (Emerson, 2006) and corruption and centralization (Glaecer & Saks, 2006).

Some techniques allow to partially overcome this problem, but they are not sufficient. For instance, in the analysis of the effects of corruption on economic growth, it has been suggested to control for endogeneity by using an index of ethno-linguistic fractionalization as an instrument (Mauro, 1995) -or other similar econometric methods -, but this instrument might be directly or indirectly correlated with economic growth (Easterly & Levine, 1997) and in consequence, it is not a valid instrumental variable. Therefore, both could respond simultaneously to an omitted cultural, legal or historical factor, such as the cultural dispositions toward leisure or morality (Mendez & Sepulveda, 2006).

In a widely cited paper on the causes of corruption (Treisman, 2000), instrumental variables are used to correct for endogeneity. It only works for one of the explanatory variables, so that the author acknowledges that, because of endogeneity problems a large question mark remains over the impact of some of the other key variables.

The same problem of circular causality arises among factors that are thought to explain corruption. For instance, democracy and openness to trade are included as explanatory variables in the equation. But democracy can foster openness and openness can fuel demands for more political liberties (Rigobon & Rodrik, 2005).

It is reasonable to think there will be problems of collinearity in corruption models. Explanatory variables like culture, religion and legal tradition are likely to be correlated It then becomes difficult to distinguish their individual influences on the corruption variable. This situation increases the risk of model misspecification: finding the correct model is not guaranteed at all because of the non-trivial relationships among elements.

c) Data

Problems go even further when testing any chosen model since results may largely depend on data (Glaeser & Sacks, 2006). Available data could be inadequate measures of theoretical and real variables or concepts. This is also a problem when controlling the strategies that have been implemented and their results

Data regarding the level of corruption are often taken from the Corruption Perception Index (CPI) compiled by Transparency International. This indicator has become the most popular measure in cross-national statistical analyses over the last several years. Literature suggests that CPI results are imprecise because of both its definition and its accuracy (Johnson, 2000). In relation with the definition, Transparency International (TI, 2000) admits that CPI components often do not measure the same thing, so that data vary widely from one year to the next.

The accuracy of CPI is also problematic because of its dependency on the accuracy of the components in a

particular year. Accuracy is also compromised by the fact that the index combines component measures that cover different set of countries.

Researchers and practitioners should be aware of measurement errors and omitted-variables bias. And, since data on corruption are based on perception indices, typically constructed from experts' assessments of overall corruption in a country, there is an additional concern on perception biases. The CPI itself suffers from an endogeneity problem because the observers' perceptions about corruption change with their perceptions about other variables, like macroeconomic performance (Seligson, 2006). Although the CPI is probably the best measure currently available for a worldwide ranking, its ratings should be interpreted with some reservation.

Corruption as a dynamic phenomenon. The non-trivial systemic character is the key first ingredient for complexity, but not the only one. The key division between complicated and complex systems depends critically upon how the system changes and is transformed (Richardson, 2005). Two types of changes can be distinguished: evolution and novelty.

1. Changes that are responses to exogenous perturbations –the *evolution* of the system-. There are two categories:
    a. Systems with observable logic links between their past and future events. Past evidence can be used to make reasonably accurate forecasts.
    b. Systems where the future cannot be predicted in any reliable way. The system can respond in many ways to environmental perturbations. The system can surprise the observers, displaying a wide-range of different qualitative behaviors. We suggest that corruption presents surprising behavior

    H3*: the corruption system is capable of surprising behaviors, by responding in more than one way to any change in its environment.*
2. Endogenous changes emerging without exogenous stimuli —the *novelty* of the system—-. This dimension describes the self-transformation of the system; its creative response to any new internal behavior, knowledge or changes in preferences (Allen & Torrens, 2005).

We suggest that due to the hierarchical character of the corruption, the phenomenon presents 'novelty':

H4*: The corruption system is capable of 'novelty', by evolving into states that are not apparent from its constituents*.

Corruption's evolution. Corruption is an *evolutionary phenomenon*. Some authors (Bardhan, 1997) portray corruption as a tenacious problem whose structure evolves over times and places. Others (Ades & Di Tella, 1997) reach an identical conclusion for political corruption. Since corruption takes place in frameworks formed by legal, economic, cultural and political elements, the phenomenon is necessarily open to institutional dynamism (Hodgson, 2002). However, the literature has also neglected the analysis of these evolutionary behaviors.

We believe corruption does not follow simple patterns of behavior in answer to environmental perturbations. Societies undergo economic, political and cultural changes that affect individual decision-making and corrupt behaviors. Corrupt agents will survive if they can learn from changes and act more efficiently than governments and markets, in an adaptive process. Because short-term fluctuations in the overall system are intrinsically unpredictable, corrupt behavior survives in a changing society. And corruption adds complexity since the answer of corrupters to changes cannot be predicted.

Moreover corruption comes in many guises. Campaigns to minimize the opportunities and incentives of any form of corruption may induce the growth of another form because corrupters may quickly adapt their behavior in order to minimize the cost of penalties or social pressures. Thus, the fight against corruption and corrupt efforts may be correlated and the "absolute integrity" results impossible (Anerchiarico & Jacobs, 1996). The legal system seems unable to keep pace with corrupters and corruption may continually expand its capacity to answer.

Corruption's 'novelty'. The literature has also timidly noted that, even without reactions to exogenous perturbations, the corrupt system itself changes (Aidt, 2003). We consider that the description of corruption as a self-transforming and creative phenomenon is essential to understand the nature of its complexity as long as this factor is able to produce a high degree of behavioral complexity.

Literature on corruption has shown two different sources of novelty: the historical and the hierarchical character of corruption. Both are consequences of the social character of mankind. Corrupt individuals desire/need to interact with other corrupt individuals in the same society or organization, creating a particular history for the corrupt system. This dimension is largely connected with the hierarchical character of the phenomenon. The incentives of an individual to be corrupt are affected by others not only because of the desire of approval, but also because that individual is part of a system, and not an isolated element.

Although it is from the decisions of self-interested individuals that corruption finally stems (Husted, 1999), the phenomenon presents a social facet. A decade ago, political and sociological studies were focused on the broad range of individual behaviors and the official vice, acting or not in "organized" (Bac, 1998) or mafia groups (Gambetta, 1993). Nowadays, most of the economic analysis on corruption focuses on collective corruption entailing voluntary collaboration among self-interested accomplices. This social nature is viewed as hierarchical (Bac, 1996; Mishra, 2002).

Controlling corruption in hierarchies introduces new complexity in the analysis of this unethical behavior (Bac, 1996) because

(a) supervisory procedures must be added (Bac, 1998) and

(b) models must include dissemination mechanisms working from upper levels to lower levels, and *vice*

versa since corruption can spread in both directions (Goudie & Stasavage, 1997).

In summary, corruption must be considered as a complex phenomenon because of the number and heterogeneity of its elements that, once they meet, form non-trivial links. These links in turn pave the way to creative changes following both the environment's evolution and inner developments of the complex system. Any effective anti-corruption strategy must explicitly tackle this complexity.

Implications

The fight against corrupt practices needs to be conducted on a broad front. Curbing corruption must avoid the use of simple and instrumental strategies. It must rely on a wide variety of actors and issues. Indicators based on single and linear cause-effect relationships (supposedly manageable by traditional regulation) are not enough. A new approach is needed.

The increasing complexity of governing cannot be addressed only in a hierarchical direction (horizontal instruments) but demands the development of continuing interaction (vertical instruments) among different actors and interdisciplinary indicators, that is, governance (Rhodes, 1997). While information, resources and capacity for anticorruption are widely dispersed and asymmetrically distributed between public and private organizations and sciences, any efficient anticorruption strategy must transform that plurality into an unique governance design.

The process of building and institutionalising a "self-organising network" for anticorruption is not easy. While relationships between government and private organizations or individuals are based on coercion and control, governance interactions between public and private organizations must be rooted in mutual trust and negotiated rules of game. Government designs horizontal instruments for coercion which connect single cause with single effect; on the contrary, governance needs vertical instruments with capacity to connect a plurality of causes and effects.

Mutual trust and negotiation with non-state actors are not habitual for policy-makers, but real governance will be only possible if this new perspective is adopted and vertical instruments are developed and implemented. To obtain the involvement of the non-state actors, the WGB suggests the design of instruments "that give voice to beneficiaries (such as beneficiary surveys and citizen scorecards)"; "enabling the development of independent and competitive media that can investigate and report on governance work" or that create "opportunities for (civil society) participation and oversight" (WBG, 2006: 12 - 14), in which the business community is considered a "crucial ally" against corruption (WBG, 2006: 17). Sadly, its appeals to governance are still limited to the methodological arena. Thus, traditional indicators focused on coercive norms continue being instrumental.

As the modern moral philosophy does, most of the literature on corruption continues to focus on sanctions. Duties and norms are emphasized, but dispositions and judgement are excluded (Melé, 2005). Similarly, institutional pressures rather than strategic analysis of social issues and stakeholders seem to guide some decision-making of multinational companies with respect to corporate social responsibility (Husted & Allen, 2006). Ethical programs from international institutions tend to be adopted primarily as a response to institutional guidelines, that is, as horizontal instruments.

But this is a very weak vision of ethics. In fact, ethics is the most vertical instrument, which allows us to explain the union between the person and his/her actions. Ethics contains all the person's facets, including rules, habits, dispositions and goals. A complete ethical understanding results an instrument able to link diverse issues and actors in the fight against corruption.

Corrupt behaviour must be understood as a prâxis, that is, as an action which is the result of many diverse past activities affected by institutional rules, social norms, personal habits or individual and organizational values. While government regulations investigate what causes corruption, and its resolution through the change a concrete cause, ethics investigates why corruption exists, obligating us to understand simultaneously dispositions, rules, values and goods.

Ethics is often presented in a fragmented manner as a separate set of rules, principles, values and virtues (Melé, 2005). However, those elements form a unity. This leads us to an appropriate analogy. Corruption is a complex phenomenon, whose diverse elements form a unity. Its eradication obligates us to employ similar instruments, that is, complete governance instruments, such as ethics.

Our conclusion is that, because of its nature of complex social phenomenon, corruption needs governance solutions. Regulation works exclusively in the horizontal direction. We need vertical instruments, which make it possible to permeate all the "onion layers".

The business community has gone over a part of this road, recognizing ethics as an efficient instrument which permits a vertical combat. The codes of voluntary ethical conduct or the programs on corporate social responsibility are good examples. If the business community is able to self-regulate its conduct, anti-corruption strategies must rely on these conditions and experiences in order to ensure success.

References

1. Acemoglu, D. & Verdier, T. 2000. The Choice between Market Failures and Corruption. *American Economic Review,* 90(1): 194–211.
2. Ades, A. & Di Tella, R. 1999. Rents, Competition and Corruption. *American Economic Review* 89(4): 982–993.
3. Ades, A. & Di Tella, R. 1997a. The New Economics of Corruption: A Survey and Some New Results. *Political Studies* 45(3): 496-515.
4. Aidt, T. S. 2003. Economic Analysis of Corruption: a Survey. *Economic Journal,* 113(491): 632–652.
5. Allen, P. M. & Torrens, P. M. 2005. Knowledge and Complexity. *Futures*, 37(7): 581-584.
6. Argandoña, A. 2003 Private-to-private Corruption. *Journal of Business Ethics,* 47(3): 253 – 267.

7. Argandoña, A. 2001. Corruption: The Corporate Perspective. *Business Ethics. A European Review,* 10(2): 163-175.
8. Ashforth, B. E. & Anand, V. 2003. The Normalization of Corruption in Organizations. *Research in Organizational Behaviour.* 25: 1-52.
9. Auriol, E. 2006. Corruption in Procurement and Public Purchase. *International Journal of Industrial Organization,* 24(5): 867-885.
10. Bac, M. 1996. Corruption and Supervision Costs in Hierarchies. *Journal of Comparative Economics,* 22(2): 99-118.
11. Bac, M. 1998. The Scope, Timing, and Type of Corruption. *International Review of Law and Economics.* 18(1): 101-120.
12. Backlund A. 2000. The Definition of System. *Kybernetes* 29(4): 444-451.
13. Banerjee, A. 1997. A Theory of Misgovernance. *Quarterly Journal of Economics,* 112(4): 1289–1332.
14. Bardhan, P. 1997. Corruption and Development: A Review of Issues. *Journal of Economic Literature,* 35(3): 1320-1346.
15. Batty M. & Torrens, P. M. 2005. Modeling and Prediction in a Complex World. *Futures* 37(7): 745-766
16. Becker, G. & Stigler, G.J. 1974. Law Enforcement, Malfeasance and Compensation of Enforcers. *Journal of Legal Studies,* 3(1): 1-18
17. Blackburn, K., Bose, N. & Haque, M.E. 2006. The Incidence and Persistence of Corruption in Economic Development. *Journal of Economic Dynamics and Control,* 30(12): 2447-2467.
18. Bliss, C. & Di Tella, R. 1997. Does Competition Kill Corruption? *Journal of Political Economy,* 105(5): 1001–1023.
19. Bowles, R., & Garoupa, N. 1997. Casual Police Corruption and the Economics of Crime. *International Review of Law and Economics,* 17(1): 75–87.
20. Brian A. W., Durlauf, S. & Lane, A. (Eds.). 1997. *The Economy as an Evolving Complex System.* Reading, MA: Addison-Wesley.
21. Brock, W. & Durlauf, S. 2001. Discrete Choice with Social Interactions. *Review of Economic Studies,* 68(2): 235-60.
22. Brunetti A. & Weder, B. 2003. A Free Press is Bad News for Corruption. *Journal of Public Economics,* 87(7): 1801-1824.
23. Buccirossi, P. & Spagnolo, G. 2006. Leniency Policies and Illegal Transactions. *Journal of Public Economics,* 90 (6-7): 1281-1297.
24. Buscaglia, E. 2001. An Analysis of Judicial Corruption and Its Causes: An Objective Governing-Based Approach. *International Review of Law and Economics*, 21: 233-249.
25. Calhoun M. A. 2002. Unpacking Liability of Foreignness: Identifying Culturally driven External and Internal Sources of Liability for the Foreign Subsidiary. *Journal of International Management,* 8(3): 301-321.
26. Carroll, A. 2000. A Commentary and an Overview of Key Questions on Corporate Social Performance. *Business & Society,* 39(4): 466-478.
27. Carvajal, R. 1999. Large-Scale Corruption: Definition, Causes, and Cures. *Systemic Practice and Action Research,* 12(4): 335-353
28. Caselli, F., & Morelli, M. 2004. Bad Politicians. *Journal of Public Economics* 88(3-4): 759-782.
29. Cillier, P. 2005. Knowledge, Limits and Boundaries. *Futures*, 37: 605-613.
30. Clarke, G.R.G. & Xu, L.C. 2004. Privatization, Competition, and Corruption: how characteristics of Bribe Takers and Payers Affect Bribes to Utilities. *Journal of Public Economics,* 88(9-10): 2067–2097.
31. Cole, M. A. 2007. Corruption, Income and the Environment: An Empirical Analysis. *Ecological Economics,* 62(3-4): 637-647.
32. Coleman, W. D. & Perl, V. 1999. Internationalized Policy Environments and Policy Network Analysis. *Political Studies,* 47: 691–709.
33. Collier, M. W. 2002. Explaining corruption: An Institutional Choice Approach. *Crime, Law and Social Change,* 38(1): 1-32.
34. Davis, H.J. J. A. & Ruhe: 2003, "Perceptions of Country Corruption: Antecedents and Outcomes" *Journal of Business Ethics* 43(4): 275-288.
35. Day R. H. 1994. *Complex Economic Dynamic,* Vol. I. Cambridge, MA: MIT Press.
36. Doig, R. A. 1995. Good Government and Sustainable Anti-Corruption Strategies: a Role for Independent Anti-Corruption Agencies? *Public Administration and Development,* 15(2): 151-165.
37. Dollar, D. Hallward-Driemeier, M. & Mengistae, T. 2005. Investment Climate and Firm Performance in Developing Economies, *Economic Development and Cultural Change,* 54(1),1-31.
38. Easterly, W. & Levine, R. 1997. Africa's Growth Tragedy: Politics and Ethnic Divisions. *Quarterly Journal of Economics,* 112(4): 1230–1250.
39. Eberlein B. & Kerwer, D. 2004. New Governance in the EU: A theoretical Perspective. *Journal of Common Market Studies,* 42(1): 121-141.
40. Egger P. & Winner, H. 2006. How Corruption Influences Foreign Direct Investment: A Panel Data Study. *Economic Development and Cultural Change,* 54: 459–486
41. Eggleston, K., Posner, E. & Zeckhauser, R. 2000. The Design and Interpretation of Contracts: Why Complexity matters. *Northwestern University Law Review,* 95(1): 91-132
42. Emerson, P.M. 2006. Corruption, Competition and Democracy. *Journal of Development Economics,* 81(1): 193-212.
43. Everett, J., Neu, D. & Shiraz, A. 2007. Accounting and the Global Fight Against Corruption. *Accounting, Organizations and Society,* 32(6): 513-542.
44. Fisman, R. & Gatti, R. 2002. Decentralization and Corruption: Evidence Across Countries. *Journal of Public Economics,* 83 (3): 325–345.
45. Foellmi, R. & Oechslin, M. 2007. Who Gains from Non-collusive Corruption? *Journal of Development Economics,* 82(1): 95-119.
46. Foster J. 2005. From Simplistic to Complex System in Economics. *Cambridge Journal of Economics,* 29(6): 873-892.
47. Fredriksson, P.G. & Svensson, J. 2003. Political Instability, Corruption and Policy Formation: the Case of Environmental Policy. *Journal of Public Economics,* 87(7): 1383-1405.
48. Friedman, E., Johnson, S., Kaufmann, D. & Zoido-Lobaton, P. 2000. Dodging the Grabbing Hand: the Determinants of Unofficial Activity in 69 Countries. *Journal of Public Economics,* 76 (3): 459–493
49. Gambetta, D. 1993. The Sicilian Mafia: The Business of Private protection. Cambridge, MA: Harvard University Press.

50. Gaviria, A. 2002. Assessing the Effects of Corruption and Crime on Firm Performance: evidence from Latin America. *Emerging Market Review,* 3(3): 245-268.
51. Giddens, A. 1983. *Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis. Berkeley,* CA: U. of California Press.
52. Glaeser E. L. & Sacks, R. 2006. Corruption in America. *Journal of Public Economics,* 90(6-7): 1053-1072.
53. Goodwin, B. 1994. *How the Leopard Changed Its Spots:* The Evolution of Complexity. New York: Touchstone.
54. Goudie, A. W. & Stasavage, D. 1997. A Framework for the Analysis of Corruption. *Crime, Law and Social Change,* 29(2-3): 113-159.
55. Grandmont, J. M.: 1985. On Endogenous Competitive Business Cycles. *Econometrica,* 53(5): 995-1045.
56. Guerrero, M. A. & Rodríguez-Oreggia, E. 2008. On the Individual Decisions to Commit Corruption: A methodological contrast. *Journal of Economic Behavior and Organization,* 65(2): 357-372.
57. Guriev, S. 2004. Red Tape and Corruption. *Journal of Development Economics,* 73(2): 489-504.
58. Hauk, E. & Saez-Marti, M. 2002. On the Cultural Transmission of Corruption. *Journal of Economic Theory,* 107(2): 311-335.
59. Herzfeld, T. & Weiss, C. 2003. Corruption and Legal (In)Effectiveness: An Empirical Investigation. *European Journal of Political Economy,* 19(3): 621-632.
60. Hodgson, G. M. 2002. Darwinism in Economics: from Analogy to Ontology. *Journal of Evolutionary Economics,* 12(3): 259-281.
61. Holland, J. H. 1995. *Hidden Order: How Adaptation Builds Complexity.* Reading, MA: Helix Books.
62. Husted B. W & Allen, D. 2006. Corporate social responsibility in the multinational enterprise: strategic and institutional approaches. *Journal of International Business Studies,* 37: 838–849.
63. Husted, B. W. 1999. Wealth, Culture, and Corruption. *Journal of International Business Studies,* 30(2): 339–359.
64. Jain, A. 2001. Corruption: a review. *Journal of Economic Surveys,* 15(1): 71–121.
65. Jansen, E. & Von Glinow, M. A. 1985. Ethical Ambivalence and Organizational Reward Systems. *Academy of Management Review,* 10(4): 814-822.
66. Jensen, M. C. & Meckling, W. H. 1976. Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure. *Journal of Financial Economics,* 3(4): 305-360.
67. Johnson, S., Boone, P., Breach, A. & Friedman, E. 2000. Corporate Governance in the Asian Financial Crisis. *Journal of Financial Economics,*58(1-2): 141–186.
68. Johnson, N. F. 2007. *Two's Company, Three is Complexity: A simple guide to the science of all sciences.* Oxford: Oneworld.
69. Jordan A., Wurzel, R. & Zito, A. 2006. The Rise of "New" Policy Instruments. *Political Studies,* 53, 477-496.
70. Kauffman, S. 1995. *At Home in the Universe: The Search for Laws of Self-Organization and Complexity.* New York: Oxford University Press, New York.
71. Kaufmann, D. 2001. *Governance and Corruption.* Brussels: European International Policy Forum.
72. Kaufmann, D. 1998. Challenges in the Next Stage of Anti-corruption. In *New Perspectives on Combating Corruption.* Transparency International and Economic Development Institute of the World Bank.
73. Kaufmann, D.1997. Corruption: The Facts. *Foreign Policy,* 107, 114-131.
74. Kingston, C. 2007. Parochial corruption. *Journal of Economic Behavior & Organization,* 63(1): 73-87.
75. Klitgaard, R. 1988. *Controlling Corruption.* Berkeley, CA: University of California Press.
76. Kumar, R., Rangan, U. & Rufín, C. 2005. Negotiating complexity and legitimacy in independent power project development. *Journal of World Business,* 40: 302-320.
77. La Porta, R., Lopez-de-Silanes, F., Shleifer, A. & Vishny, R. W. 1997. Trust in Large Organizations. *American Economic Review,* 87(2): 333-338.
78. Lambert-Mogiliansky, A.2002. Why Firms Pay Occasional Bribes: The Connection Economy. *European Journal of Political Economy,* 18(1): 49-63.
79. Lambsdorff, J. G. 1998. Making Corrupt Deals: Contracting in the Shadow of the Law. *Journal of Economic Behaviour and Organizations,* 48(3): 221-241.
80. Lambsdorff, J. G. 2002. How Confidence Facilitates Illegal Transactions: An Empirical Approach. *American Journal of Economics and Sociology,* 61(4): 829–853.
81. Li, S. 2004. Why are Property Rights Protections Lacking in China? An Institutional Explanation. *California Management Review,* 46(3): 100–115.
82. Loasby, B. J. 1998. The Organisation of Capabilities. *Journal of Economic Behaviour & Organization,* 35: 139-160
83. Lorenz, E. 1993. *The Essence of Chaos.* Seattle, Washington: University of Washington Press.
84. MacLeod, W. B. & Pingle, M. 2005. Aspiration Uncertainty: its Impact on Decision Performance and Process. *Journal of Economic Behavior & Organization,* 56(4): 617-629.
85. Marengo, L. & Dosi, G. 2005. Division of Labor, Organizational Coordination and Market Mechanisms in Collective Problem-Solving. *Journal of Economic Behaviour and Organization,* 58(2): 303-326.
86. Mauro, P. 1995. Corruption and Growth. *Quarterly Journal of Economics,* 110(3): 681–712.
87. Mauro, P. 1998. Corruption: Causes, Consequences, and Agenda for Further Research. *Finance & Development,* 35: 11-13.
88. Melé, D. 2005. Ethical Education in Accounting: Integrating Rules, Values and Virtues. *Journal of Business Ethics,* 57(1): 97-109.
89. Méndez, F. & Sepúlveda, F. 2006. Corruption, Growth and Political Regimes: Cross-country Evidence. *European Journal of Political Economy,* 22(1): 82–98.
90. Michael B. 2004. What Do African Donor-sponsored Anti-corruption Programs Teach Us about International Development in Africa? *Social Policy & Administration,* 38 (4): 320–345.
91. Mishra, A. 2002. Hierarchies, Incentives and Collusion in a Model of Enforcement. *Journal of Economic Behavior & Organization,* 47(2): 165-178.

92. O'Malley R., Cavender-Bares, K. & Clark, W. 2003. "Better" data: not as Simple as It Might Seem. *Environment,* 45 (1): 8-18.
93. Pantzalis C., Park J. & Sutton N. 2007. Corruption and Valuation of Multinational Corporations, *Journal of Empirical Finance,* in press
94. Pierre, J. 2000. *Governance and Comparative Politics.* Oxford: Oxford University Press.
95. Prendergast, C. 1999. The Provision of Incentives in Firms. *Journal of Economic Literature,* 37(1): 7-63.
96. Rhodes, R. A. W. 1997. *Understanding Governance.* Buckingham: Open University. Press.
97. Richardson, K. 2005. The Hegemony of the Physical Sciences: an Exploration in Complexity Thinking. *Futures,* 37: 615-653
98. Rigobon, R. & Rodrik, D. 2005. Rule of law, Democracy, Openness, and Income Estimating the Interrelationships. *Economics of Transition,* 13(3): 533–564.
99. Rodriguez, P., Uhlenbruck, K. & Eden, L. 2005. Government corruption and entry strategies of multinationals. *Academy of Management Review,* 30(2): 383–396.
100. Rose-Ackerman, S. 2002. Grand Corruption and the Ethics of Global Business. *Journal of Banking and Finance,* 26(9): 1889-1918.
101. Rose-Ackerman S. 1999. *Corruption and Government: Causes, Consequences and Reform.* Cambridge: Cambridge University Press.
102. Rosser, J. B. Jr. Ed. (2009) Handbook of Complexity Research; Cheltenham: Edward Elgar.
103. Sanyal, A., Gang, I. N. & Goswami, O. 2000. Corruption, Tax Evasion and the Laffer Curve. *Public Choice,* 105(1-2): 61-78.
104. Schiavo L. L. 2000. Quality Standard in the Public Sector: Differences between Italy and the UK in the Citizen's Charter Initiative. *Public Administration,* 78 (3) 669-689.
105. Scott, J.C. 1972. *Comparative Political Corruption.* Englewoods Cliffs: Prentice-Hall.
106. Seligson, M. A.. 2006. The Measurement and Impact of Corruption Victimization: Survey Evidence from Latin America. *World Development,* 34(2): 381–404.
107. Seligson, M. A. 2002. The Impact of Corruption on Regime Legitimacy: A Comparative Study of Four Latin American Countries. *Journal of Politics,* 64(2): 408-433.
108. Senturia, J. J. 1931. Corruption, Political. In *Encyclopaedia of the Social Sciences, vol. IV:* 448-452
109. Simon H. 2002. Near Decomposability and the Speed of Evolution. *Industrial and Corporate Change,* 11(3): 587-599.
110. Stoker G. 1998. Governance as Theory. *International Social Science Journal,* 155: 17-28.
111. Sung, H. 2004. Democracy and Political Corruption: A Cross-National Comparison. *Crime, Law & Social Change,* 41(2): 179–194.
112. Tanzi, V. 1995. Corruption Arm's Length Relationships and Markets. In G. Fiorentini G and S. Peltzman, (eds.). *The Economics of Organised Crime.* Cambridge: Cambridge University Press.
113. Tanzi, V. 1998. Corruption Around the World. *IMF Staff Papers* 45(4): 559–594.
114. Tavares, S. 2007. Do Rapid Political and Trade Liberalizations Increase Corruption? *European Journal of Political Economy,* 23 (4): 1053-1076
115. Tavares, J. 2003. Does Foreign Aid Corrupt? *Economics Letters,* 79(1) 99-106.
116. Transparency International. 2000-2006. *Global Corruption Report.* Berlin: Transparency International.
117. Treisman, D. 2000. The Causes of Corruption a Cross National Study. *Journal of Public Economics,* 76(3): 399–457.
118. United Nations. 2004. *The Global Programme Against Corruption. U.N. anti-corruption toolkit.* United Nations Office on Drugs and Crime.
119. Van Rijckeghem, C. & Weder, B. 2001. Bureaucratic Corruption and the Rate of Temptation: do Wages in the Civil Service Affect Corruption, and by how much? *Journal of Development Economics,* 65(2): 307–331.
120. Von Alemann, U. 2004. The Unknown Depths of Political theory: The case for a Multidimensional Concept of Corruption. *Crime, Law and Social Change,* 42(1): 25-34.
121. Wei, S. J. 2000. How Taxing is Corruption on International Investors. *Review of Economics and Statistics,* 82(1): 1–11.
122. Wei, S. J. 2001. Domestic Crony Capitalism and International Fickle Capital: is there a Connection? *International Finance,* 4(1): 15–45.
123. Williamson, O. 1975. *Markets and Hierarchies, Analysis and Antitrust Implications: a Study in the Economics of Internal Organization.* New York: Free Press.
124. Williamson, O. 1996. Economic Organization: The Case for Candor. *The Academy of Management Review,* 21(1): 48-57.
125. Williamson, O. 1999. Strategy Research: Governance and Competence Perspectives. *Strategic Management Journal,* 20(12): 1087-1108;
126. Wolf T. & Gürgen, E. 1996. Improving Governance and Fighting Corruption in the Baltic and CIS Countries. *Economic Issues,* International Monetary Fund, 21.
127. WBG. 2006. *Strengthening Bank Group Engagement on Governance and Anticorruption.* DC 2006-0017.
128. Wu, X. 2005. Corporate Governance and Corruption: A Cross-Country Analysis. *Governance,* 18(2): 151–170.
129. You, J. S. & Khagram, S. 2005. A Comparative Study of Inequality and Corruption. *American Sociological Review,* 70(1): 136-157.
130. Zajac, E. & Kraatz, M. 1993. A Diametric Forces Model of Strategic Change: Assessing the Antecedents and Consequences of Restructuring in the Higher Education Industry. *Strategic Management Journal,* 14: 83-102.

NOTES

[1] For an introduction to the study of complexity, see Holland (1995).

[2] Beyond that consensus, an ongoing debate persists in certain contexts over the exact meaning of terms such as discretionary power, misuse or penalty. The public or private character of discretionary power, the existence of illicit but legal corruption, or the corruption without monetary rents are several examples of problematic questions.

[3] "Market corruption" (Scott, 1972)—rents are allocated competitively to whichever firm or citizen who pays the highest bribes— has been studied in relation with rent-seeking contexts (Nitzan, 1994). "Parochial corruption" —situation where barriers to access favors of power-holders (Lambbsdorff, 2002)— has been related with favoritism and linked with social structure (Kingston, 2007).