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# Corruption and Government Roles: Causes, Economic Effects, and Scope*

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This paper reviews recent advances in the economic literature on corruption in order to put some of this material into a broader analytic perspective. Using widely accepted definition of corruption in the literature, we argue that excessively centralized government structure is one of the ultimate factors that drive high level of corruption. In accordance with existing studies, we found there is ample evidence that corruption reduces economic efficiencies and has significant distributional consequences. In addition, due to widespread criticism of conventional perception-based corruption measures, we develop alternative measure of corruption that allows more fruitful empirical studies. The estimated magnitude of corruption in Korea suggests a number of important policy implications.

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# 1. INTRODUCTION

Corruption is both pervasive and significant around the world (Shleifer and Vishny, 1993). It is often regarded as a significant contributor to low economic growth, to stifle investment, to inhibit the provision of public services, and to extensively increase income inequality. Corruption is not just something that happens to poor countries since it is also quite common in the developed countries such as the United States (Glaeser and Saks, 2006). The aim of this paper is to review recent advances in the economic literature on corruption in order to put some of this material into a broader analytic perspective. In addition, widespread criticism of conventional corruption measures based on perception of corrupt activities owning to their subjective nature motivates us to develop alternative measure of corruption that allows more fruitful empirical studies.

Until the 1970s, studies on corruption were mostly restricted to the fields of sociology, political science, history, public administration, and criminal law. Ever since the seminal work by Rose-Ackerman (1975), economists from different fields have made substantial contributions to the analysis of corruption, largely on account of its increasingly evident link to economic performance. On the other hand, for a relevant concept of corruption,[1] the modern economic literature on rent seeking, for example, Krueger (1974), has analyzed the relationship between trade distortions, rent seeking behavior, and economic inefficiencies.[2] Much of the early studies related to corruption focused on weaknesses in public institutions and distortions in economic policies that gave rise to rent seeking by public officials and the incubation of corrupt practices (Basu, Bhattacharya, and Mishra, 1992; Hayes and Wood, 1995; Mauro, 1997; Moene, 1986; Rashid, 1981).

Economists now know quite a bit about the causes and consequences of corruption.[3] A key principle is that corruption can occur where potential

[1] For concepts similar to corruption widely used in the literature, see section 2 in this paper.
[2] As an example, Murphy, Shleifer, and Vishny (1991) suggested that countries where talented people are allocated to rent-seeking activities will tend to grow more slowly.
[3] See Ades and Di Tella (1997), Abed and Gupta (2003), Bardhan (1997), Jain (2001), and

private gains exist, customarily, as a result of government regulation and public officials have discretion in allocating them.[4] Therefore researchers agree the discretionary and monopoly power of government officials is the ultimate factor that drives corruption. More recently, researchers have begun to test some of these long-established theoretical hypotheses using new cross-country data, typically, indices on the perceived corruption levels produced by private rating agencies.[5] The common conclusion is that corruption reduces economic growth and investment, biases resources towards government or public investment and away from operations and maintenance, and redirects foreign direct investment towards countries with lower level of perceived corruption. In addition, more importantly, corruption results in significant distributional effects on the economy. Theoretical and empirical studies have suggested several channels through which corruption may affect economic efficiency and income inequality. These include overall growth, biased tax systems, and poor targeting of social programs as well as through its impact on asset ownership, human capital formation, education inequalities, and uncertainty in factor accumulation, among others.

There is increasing recognition that corruption has substantial, adverse effects on economic growth. However, if the social costs of corruption are so high, it is puzzling why countries do not strive to improve their institutions and root out corruption and there exist many countries stuck in vicious circles of widespread corruption and low economic growth. Whereas corruption is an old topic, formal research on corruption in Economics is not too long. There are a number of reasons why this topic has come under fresh scrutiny as follows. First, the accelerating trend of globalization has increased the pressure on countries to be more transparent and accountable. This relatively new economic environment has created incentives for policymakers to

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Aidt (2003), among others, for comprehensive accounts of the latest developments on corruption.

4) The classic example of a government restriction resulting in private gains is that of an import quota and the associated licenses that civil servants give to those entrepreneurs willing to pay bribes.

5) These indices are obviously imperfect due to their subjective nature, but can yield useful insights. See section 5 for more detailed discussion.

reform policies and institutions for countries to benefit from the rising international flows of capital, technology, and information.[6] Second, a series of world-wide financial crises since the late 1990s have reduced private capital flows to developing countries. The importance of this development to growing interest in the economics of corruption is compelling. Since the early postwar period, international official flows to developing countries had been motivated by the desire to maintain political influence in various strategic areas. As a consequence, the strict criteria of economic performance and commitment to reform played only a minor role in many developing countries. On the other hand, after the financial crises, developing countries and emerging economies found themselves in a highly competitive environment where financial flows were now driven by expected rates of return on investment.[7] Thus researchers could not help but be stuck by the importance of sound policies and institutions. Lastly, growing availability of corruption indices further stimulated the empirical research in a number of directions. Despite their potential shortcomings, the data measuring perceived corrupt activities in a country enables researchers to study a variety of aspects of corruption. The general consensus in the empirical studies with corruption measures is that the social costs of corruption and weak governance are substantial. Moreover, the intensity of corruption estimated by researchers seems to be more serious and persistent than they expected.

As we highlighted above, government plays an extremely important role in explaining all respects of corruption, such as the causes, consequences, scope, and control of corruption. Since the early 20th century, the roles of government have been broader and stronger as government is believed to

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[6] Especially for emerging and developing economies, data on the size and composition of international capital movements underline this point. Since the early 1990s, the composition of capital flows to emerging and developing countries began to shift markedly from official transfer to private sector and financial markets.

[7] Sound macroeconomic policies, a healthy regulatory environment, more transparent and accountable public institutions, and protection of property and investor's rights became essential prerequisites for attracting foreign direct investment and for accessing financial markets at reasonable terms.

serve as a corrector of market failures associated with information asymmetries, non-competitive markets, principal-agent problems, externalities, or public goods. Ludicrously, the role of government has become more important in less developed countries which came to involuntarily adopt market economy.[8] For the less developed countries, an escape from absolute poverty and an engagement of economic development through industrialization were on immediate agenda and thus the leading role of government was widely regarded as inevitable. In the initial stage of economic development to break the vicious circle of poverty, the governments rigorously intervened private sectors suffering from a desperate shortage of financial sources and even engaged in a variety of major industrial projects by expanding public expenditures.

Similar to most less development countries, after a series of wars in the mid-twentieth century, Korea had to aim at economic development and growth. Under government-directed economic growth plans (i.e., centralized management economic system), Korea took unbalanced growth strategies by means of export-oriented industrialization as financial capital inflows were heavily poured into specific industrial sectors. This might be unavoidable for the government to take a leading role in setting up a systematic economic development plan when a self-governing market economy had not been established. In addition, aggressive interventions by the government have been justified as one of contributing factors of economic success.[9] A general consensus is that a strong (central) government doctrine is no longer desirable for the future development of Korea, since the government-led economic growth plan would no longer work for sustainable economic growth.[10] Thus it is inevitable that the role of government must be adjusted

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[8] In particular, the shift from command economies to free market economies has created massive opportunities for the appropriation of rents and has often been accompanied by a change from a well-organized system of corruption to a more deleterious one.

[9] Amsden (1989), Wade (1990), Johnson (1994), and Flynn (1999), among other, support the strong leading role of government in less developed countries. For instance, a small group of elite decision makers plays an important role in initiating economic development and active interventions can facilitate efficient allocation of resources with priority given to growth-led sectors. See Lee (2004) for more detailed discussion.

[10] This is consistent with recent observations that slow economic growth has persisted in

toward improving economic efficiency and correcting economic inequality. In this study, however, we do not directly attempt to find a new paradigm for the government system.[11] Instead, we focus on economic effects of the centrally managed economic system in terms of bureaucratic corruption. In particular, this paper studies how corruption is associated with the centrally managed economic system.

It is hard to overstate the economic and social significance of corruption. However, the lack of reliable and systematic data had kept corruption out of the research agenda of empirical studies as corruption is a variable that cannot be measured directly. On the other hand, in recent years, several organizations have developed a corruption perception-based index across a wide range of countries to qualitatively assess the pervasiveness of corruption, for example, Corruption Perception Index published by Transparency International. Indisputably, these perception-based indices have made a tremendous contribution to the understanding of causes and consequences of corruption. Notwithstanding their potential benefits, researchers routinely point out that those measures suffer from serious shortcomings, notably, their subjective nature.[12] While no direct way of measuring corruption has been proposed, there may be indirect ways of estimating the magnitude of corruption by using information about causes of corruption. Thus it is imperative to develop an alternative measure that provides quantitatively fruitful estimate of corruption across countries. In this study, we incorporate the ultimate source of corruption directly into an empirical specification model to estimate the magnitude of corruption. The estimated magnitude of corruption together with underground economy for Korea suggests a number of important policy implications. In particular, we found that, in Korea, the magnitude of corruption has been substantial and exhibited substantial persistence. Moreover, using the new measure of

many countries with malfunctioning institutions.

[11] See Lee (2003) for more detailed discussion on economic development experience of Korea and its future policy agenda.

[12] Other probable drawbacks of perception-based corruption measures are they are not directly related to main causes of corruption, tend to generate artificial persistency, are not suitable for evaluating the size of corruption because they are ordinal indices, among others.

corruption, we also examine how the government has played in contributing the dynamic features of corruption in Korea.

The remainder of this paper is structured as follows. Section 2 presents a general definition of corruption and some relevant concepts. Section 3 discusses factors that drive corruption and proposes the ultimate source of corruption. Section 4 is devoted to a discussion of the economic effects of corruption by focusing on economic efficiency and income inequality. Section 5 describes traditional measures of perception-based measures of corruption and their potential shortcomings and develops new measure of corruption. In addition, the magnitude of corruption in Korea is estimated from 1970-2006. Concluding remarks including discussion about controlling corruption are contained in section 6.

## 2. THE DEFINITION OF CORRUPTION

Since corruption is an immensely complex phenomenon that is almost impossible to be explained by a single aspect, corruption has been defined in many different ways, each lacking in some facet. As a consequence, one of the difficulties of studying corruption lies in defining it. In fact, there exists a significant body of literature that describes variations of corruption and their economic effects. In this study, we follow the most popular and simplest definition of corruption employed by Barreto (2000), Jain (2001), Mauro (1995), Shleifer and Vishny (1993), Tanzi (1998), among others, that it is "the abuse of public power for private benefit." Corruption can therefore take place in any economic transaction involving the public sector. In this sense, this definition is often referred to as government corruption or bureaucratic corruption. It is worth pointing out that this definition does not necessarily imply that corruption cannot exist within private sector. In addition, since this definition involves the activities of public officials with the discretionary power that create the misallocation of resources, it becomes difficult to draw a clear distinction between rent-seeking behavior and

corruption (Krueger, 1974). Corruption defined this way would include a variety of forms, such as the sale of government property by government officials, kickbacks in public procurement, bribery and embezzlement of government funds.[13)]

According to the definition employed in this paper, the most important ingredient for corruption to occur and persist is the discretionary or monopoly power that government can deliberately create. That is, corruption is generally related to the activities of the government having the discretionary power. When public officials possess the monopoly to design or administer regulations, it becomes easy for them to exploit their discretionary power to extract economic rents or create rents that can be extracted. Therefore government corruption involves not only the payment of bribes that is considered as the most popular practice of corruption but also the misallocation of public resources by government officials for the purpose of their private benefits. Since the monopoly power of the government enables the officials to improperly transfer resources from one party to another, it creates room for corruption.[14)] Consequently, the discretionary power of government can create rents for public officials or bureaucrats, induce misallocation of resources, and increase the size of the bureaucracy (Acemoglu and Verdier, 2000).

It is worth noting that there also exist some concepts similar to corruption in the literature.[15)] Most of all, rent-seeking behavior, the socially costly pursuit of transfer, is frequently considered to study social welfare effects of corruption, for example, Appelbaum and Katz (1987), Bhagwati, Brecher, and Hatta (1985), Congleton (1988), among others. Second, Bhagwati (1982) proposed directly unproductive, profit-seeking (DUP) activities that have no direct productive purpose (neither increasing consumer utility nor

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13) In practice, how corruption is defined actually ends up determining what gets modeled and measured and most studies have focused on a specific form of corruption.

14) An example would be that the president of a country who has an airport built in his or her small hometown is engaging in an act of corruption that does not involve the payment of bribes (Tanzi, 1998).

15) For more detailed discussion about relevant concepts of corruption, see Lee and Kim (2000).

contributing to production of a good or service that would increase utility) and are motivated by the desire to make profit, typically from market distortions created by government policies. This is a more general concept that embraces a wide range of economic activities, including rent-seeking behavior. Finally, activities outside formal markets are commonly referred to as underground economy, unofficial economy, shadow economy, or black market are introduced. The majority of conventional studies on underground economy have focused on the effects of taxes on the size of underground economy and social welfare. Although the relationship between corruption and underground economy is not clear in some theoretical model as they can be either substitute or complement each other, most empirical studies suggest that a positive relationship between underground economy and corruption. In general, these concepts related to corruption are broader than our definition of corruption in the sense that they include legal economic activities as well as illegal ones. In addition, our definition of corruption centers on the exploitation of public or government power whereas the relevant concepts include both private and public aspects of corruption. It clearly is of interest to investigate the general characteristics of these various concepts related to corruption as well as their economic effects compared to corruption. However, this analysis would take us well beyond the scope of the current paper and therefore we concentrate on the definition of corruption defined above for the rest of this paper.

## 3. FACTORS DRIVING CORRUPTION

In this section, we study factors contributing directly to corruption. Corruption is generally believed to distort markets and to impose major social costs on the economy. In order to control corruption, it is imperative to find out what causes corruption. A number of studies have cast about theoretical and empirical correlations between corruption and a variety of its potential determinants to answer what variables can robustly explain the

variations in corruption over time and across countries.[16] Unfortunately, there has not been a successful answer to this question in the literature. That is, economists disagree about how best to explain the cause of corruption. This does not come as surprise because it is hard to believe that there exists a single dominant factor that is entirely responsible for the level of corruption. Moreover, there is no consistent empirical specification for finding sources of corruption.[17]

Despite a lack of consensus on this issue, researchers have documented potential causes of corruption in a number of directions (Ali and Isse, 2003; Paldam, 2002; Rose-Ackerman, 1999; Treisman, 2000). First, it is widely known that any type of rent-seeking behavior requires the availability of rents. In the similar manner, corruption is likely to occur where such exploitable profits can be generated by government restrictions and interventions. Examples include trade restrictions such as tariffs and import quotas, industrial policy favors such as government subsidies and tax credits, price controls, and government-controlled provision of credit, among others (Mauro, 1995). Next, Brunetti and Weder (2003), Fisman and Gatti (2002), Graeff and Mehlkop (2003), and Seldadyo and de Haan (2005), among others, suggest that there is a clear link between corruption and institutional variables, for instance, political structure, political freedom, judiciary system, and information structure. Although it is hard to imagine that, in practice, any particular institutional factor originates corruption, the level of corruption relies on the institutional variables. Third, some studies argues that corruption is more likely to take place when public officials are paid relatively low wages compared with similarly qualified workers in the private sector and thus often resort to actively collecting bribes.

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[16] Paldam (2002), for example, investigates the cross-country pattern by using a collection of variables such as the level and growth of real income per capita, the inflation rate, the economic freedom index, cultural dummies, and the Gastil index for democracy. For an excellent survey on the determinants of corruption, see Seldadyo and de Haan (2005).

[17] This is mainly because existing theories on corruption provides little guidance in constructing a proper empirical specification. A number of statistical models incorporating a wide variety of explanatory variables have been used to find the ultimate source of corruption. However, it is commonly recognized that the correlation between corruption and a potential determinant depends on the specification of empirical model.

Lastly and most importantly, the centralized government in national level that is capable of creating monopoly power is extensively regarded as the ultimate source of corruption. Since, in the previous section, corruption is define as the abuse of the monopoly and discretionary power of the government for private gain, the most important force that drives corruption must be identified with the one that creates the discretionary power. In this paper, we argue that the centralization of government is the fundamental source of corruption and an economic approach aimed at curbing government corruption is to increase the level of competition among bureaucrats as suggested by Ades and Di Tella (1997), Bliss and Di Tella (1997), and Rose-Ackerman (1978).

So far as that is concerned, there has been considerable debate on the merits of government decentralization. While this discussion has, in the past, centered on the provision of the greater variety of public goods that may result from decentralization, more recently, greater emphasis has been placed on the role that decentralization may have in curtailing the level of corruption. For example, Fisman and Gatti (2002) focused on the link between political structure and corruption by stressing decentralization. They examined the cross-country relationship between fiscal decentralization, as measured by a number of different indices, and corruption and found that fiscal decentralization in government expenditure is consistently associated with lower measured corruption across countries.[18] On the other hand, there also exist arguments against decentralization in fighting corruption. Albeit its benefits, some have argued that there exist many imperfections in the local provision of services that may prevent the realization of benefits from decentralization.[19] While there is a general belief that decentralization and

[18] The result is highly statistically significant, is not strongly influenced by the presence of outlier countries, and is robust to a wide range of statistical specifications, including all of those that have been used in the recent cross-country literature on corruption.

[19] For example, local bureaucrats may be poorly trained and thus inefficient in delivering public goods and services. In addition, Brueckner (2000) argues that decentralized regimes are less likely to attract high quality bureaucrats, since the rewards to local politicians will be small relative to bureaucrats at the central level. A related point is made by Persson and Tabellini (2003), who note that since the national office is more prestigious and powerful, monitoring may be more intense than at the local level. One additional argument against

government corruption are negatively associated, precious few of empirical work has examined whether different types of decentralization have differential effects on corruption. Nonetheless, theoretical literature highlights the importance of expenditure decentralization to control corruption. Accordingly, in pursuit of studying the level of corruption, decentralization of public spending may be a promising passage.

## 4. ECONOMIC EFFECTS OF CORRUPTION

Evidence of government corruption exists in all societies, at all stages of economic development, and under different political and economic regimes. In terms of severity of corruption among countries, there appears to be considerable diversity in its incidence as indicated by some conventional corruption measures. However, with regard to the effects of corruption on economic efficiency, the common conclusion that the literature has found is corruption reduces economic growth and investment, biases resources towards government or public investment and away from operations and maintenance, and redirects foreign direct investment towards countries with lower level of perceived corruption.[20] In addition to its effect on economic efficiency that influences national income determination and its composition, corruption results in distributional effects on the economy. It is worth noting that corruption does not have a separate impact on economic efficiency and income distribution. For the most part, these two types of effects are interdependent. For instant, some empirical studies show that inflation and corruption are tightly linked (Al-Marhubi, 2000).[21] If higher level of

decentralization is implied by the work by Shleifer and Vishny (1993), in their discussion of corruption and double marginalization. The idea is that, if decentralization leads to greater dispersion of government decision-making powers, lack of coordination among bureaucrats in extracting bribes may lead to 'excess' rent extraction, in much the same manner that successive monopolies result in a total price markup above the monopoly level.

[20] Mauro (1997) and Tanzi and Davoodi (1997) also suggest that corruption reduces expenditure on education and health, which does not lend itself easily to corrupt practices on the part of those who make budgetary decisions.

[21] There are a number of insightful reasons why inflation and corruption may be linked. First,

corruption indeed drives high inflation, from the vast majority of empirical studies (Andrés and Hernando, 1997; Barro, 1995), a country with high and sustained inflation tends to exhibit poor performance in regard to economic growth. At the same time, inflation, particularly unexpected inflation, causes increased relative price variability, tax distortions, and arbitrary redistribution of wealth. Therefore, inflation due to corruption has tremendous consequences on income distribution of the country.

The aim of this section is to review recent developments in the economics literature on the effects of corruption in order to put some of this material into a broader analytic perspective. Since corruption disturbs the level of economic efficiency and income distribution that affect economic welfare most directly and severely, in this paper, we focus on those two issues. Notice that there also exist other important aspects of corruption examined by numerous studies. For example, corruption reduces or distorts the fundamental role of the government in such areas as enforcement of contracts and protection of property rights. It also weaken the legitimacy of the market economy and perhaps also of democracy, especially for transition economies. Furthermore, corruption reduces foreign direct investment mainly because it plays like a tax as presented in international trade theories. Wei (2000) showed that the less predictable the level of corruption, the greater is its impact on foreign direct investment. A higher variance makes corruption behaves like an unpredictable or random tax (Wei, 1997) and hence an increase in the level of corruption and its unpredictability are equivalent to increases in the tax rate on businesses.[22)]

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if tax evasion considered as a form of corruption is prevalent, governments may find it would be optimal to rely on the inflation tax as a source of government revenue. Businesses are likely to respond to corruption by going underground, thereby increasing reliance on the inflation tax. Next, corruption may also lead to capital flight, which shrinks taxable assets and income of those most able to meet government revenue requirements. Finally, by reducing revenues and increasing public spending, corruption may also contribute to larger fiscal deficits, which may have inflationary consequences for countries with less developed financial markets.

22) Wei (1997) surmised that raising the index of corruption from the Singapore level to the Mexican level is equivalent to increasing the marginal tax rate on enterprises by 20 percentage points.

### 4.1. Positive Effects of Corruption

Despite the fact that there is wide consensus that corruption detracts economic efficiency and distorts income distribution, there also exists a line of studies that highlighted some positive or beneficial effects of corruption, which was discounted in the subsequent literature.[23] First, some of the arguments in favor of the view that corruption may promote efficiency because it removes government-imposed rigidities are found in Huntington (1968) and Bardhan (1997), among others. That is, corruption can be efficient-enhancing because corruption speeds up bureaucratic procedures (oils the mechanism or greases the wheel). This reasoning has popularly used to explain the high growth rates in some developing countries or transition economies. For instance, Braguinsky (1996) argues that the improved efficiencies due to corruption may promote faster economic growth. In addition, there have been a number of studies how a specific form of corruption can affect economic efficiency. As an example, Beck and Maher (1986), Lien (1986), and Lui (1985), among others, suggest bribe which is one of distinguished forms of corruption may promote efficiency in bidding competitions by assigning projects to the most efficient agent.

Notwithstanding their purposeful implications, these theoretical arguments, which seemingly favor corruption, can be countered in various ways. First, rigidities and regulations produced by government may be unremovable features of an economy as they were often deliberately created by government officials to extract bribes. Second, according to Tanzi (1998) those who can pay the highest bribes are not necessarily the most economically efficient but rather the most successful at rent seeking. Third, the notion of efficient corruption is based on a number of problematic assumptions that make it unsatisfactory from a theoretical point of view and its empirical relevance to abate (Kaufmann and Wei, 1999; Paldam, 2002). Finally and most importantly, even if corruption indeed improves economic

[23] See Lee and Kim (2000) for more detailed discussion about how corruption can benefit an economic agent or an economy as a whole in certain environment.

efficient, it is widely accepted that it has income distribution altered, which might cause more serious problems in terms of social welfare. Therefore the recent fairly broad consensus seems to be that corruption is not justifiable in any respect.

### 4.2. Economic Inefficiency

Inefficiencies associated with government interventions in an economy are well documented in the literature (De Soto, 1989; Lal, 1985; Mauro, 1995). In the presence of grand corruption, public officials deliberately intervene the market by utilizing their discretionary power to foster their career or wealth rather than ameliorate market failure (Shleifer and Vishny, 1994). Although some researchers suggest there exists a trade-off between government failures and market failures, government interventions designed to correct market failures often lead to corruption and market inefficiencies.[24)]

There exist a number of studies to explain how corruption reduces economic efficiencies in a variety of channels and hence distort a market economy. One of the most popular arguments against corruption is its association with economic growth and development as corruption and standard of living frequently measured as per capita income are significantly negatively correlated. A plausible explanation would be corruption generally discourages private investment and, as a consequence, reduces the rate of economic growth (Bliss and Di Tella, 1997; Mauro, 1995). Such reduction in investment is mainly due to the higher costs and the uncertainty that corruption generates. The relationship between corruption and the economy is thus explained as an endogenous outcome of competition between growth-enhancing and socially unproductive investment and its reaction to exogenous factors, especially government interventions for the purpose of private benefit.[25)] Moreover, the sustainability of economic growth tends to

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[24)] Thus, in order to justify government intervention, a model must take into account the distortion it brings. For a related work, Acemoglu and Verdier (2000) developed a simple framework to analyze the links between government interventions and government failures.

[25)] Ehrlich and Lui (1999) pointed out that government intervention in private economic

rely on the level of corruption. It is generally known that a high degree of corruption has contributed to unstable growth experiences. Most empirical findings are found to be in line with this reasoning. In the past decades, using cross-sectional analysis and the available corruption indices, several studies have reported important quantitative results on the effects of corruption on economic growth and their results consistently suggest that corruption is negatively associated with the rate of growth of countries.

With regard to the impact of corruption on economic growth, an adverse effect of government size is often mentioned. For most developing countries, large government size generally, but not necessarily, is associated with relatively low rate of economic growth. Thus the size of government may have a valuable implication on the level of corruption. On the other hand, for an industrialized economy, government size is found to have little impact on the country's growth rate. Therefore, we conclude that, in general, the level of corruption depends on the structure of government but not the size of government. Specifically, what matters most for the level of corruption is how government officials can utilize their discretionary power without any restriction. In a centralized government system, it would be much easier for public officials to achieve their authority and obtain personal gains.

Some researchers have focused on how corruption distorts decision-making process and therefore reduces economic efficiency.[26] This can be explained in a number of routes. First, corruption dwindles public revenue as it increases the size of unofficial economy. In particular, corruption has an adverse impact on tax administration and on customs, and thus reduces the ability of the government to carry out needed public expenditure. Second, corruption also amplifies public spending that has little effect on economic growth and development. The reason why corruption increases public spending is apparent. Public investment projects lend themselves easily to manipulations by high-level government officials to attain private gain such as bribes. Third, Ades and Di Tella (1997 and 1999) argued that corruption

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activity hurts most in the poorest countries and those at a critical takeoff level.

[26] For a comprehensive study on this issue, see Tanzi and Davoodi (1997).

also distorts the effects of government's industrial policy on investment. In particular, ample evidence suggests that corruption increases public investment while reducing its productivity as it reduces the quality of public infrastructure by lowering expenditures on operations and maintenance for reasons similar to those that reduce expenditure for education and health. For example, most developing or transition economies that employed government-directed economic growth plan often display significant unbalanced development among industries. It thus contributes to large and persistent government budget deficits, making it more difficult for the government to run a sound fiscal policy. Fourth, corruption consistently weakens the government's capability to impose regulatory interventions necessary to correct market failures, which becomes the major role in most modern economies. When the government interventions and regulations are motivated by public officials' private gain, it is likely to add to the existing market failures and hence results in larger market inefficiency. Lastly, corruption distorts incentives for various economic agents. As a result, individuals allocate their resources to unproductive activities that often produce negative value added.

### 4.3. Income Inequality

While most studies emphasizing economic consequences of corruption have stressed the efficiency implications of corruption, the empirical literature has overlooked the distributional consequences of corruption. This is partly because of a lack of consistent and reliable cross-country data on income inequality and poverty that only lately has been rectified (Deiningera and Squire, 1998; Ravallion and Chen, 1996). Recently, the economic effect of corruption on income inequality becomes a rapidly growing research agenda in the literature. The common conclusion suggested by Gupta, Davoodi, and Alonso-Terme (2002), for example, is that corruption harms income distribution and its impact on social welfare is more severe than economic inefficiency. Especially, Barreto (2000) suggests that corruption is

neither efficiency enhancing nor efficiency detracting with respect to growth but always results in some income redistribution.

A variety of economic models have proposed several channels through which corruption may affect income inequality and poverty. First, corruption is most likely to increase poverty since it reduces income earning potential of the poor. In particular, according to Lui (1985), the rich exercise their social connections accompanied by bribes to access public resources that potentially increase their income earnings.[27] Consequently, the benefits obtained from corruption tend to accrue to the better-connected individuals in society, who belong mostly to high-income groups. On the other hand, the poor would have a hard time obtaining selective benefits from the government since corruption reduces the level of social services available to the poor. Therefore, corruption may create permanent distortions from which well-positioned individuals take advantage of government activities at the cost of the rest of the population (Gupta, Davoodi, and Alonso-Terme, 2002).[28] Second, individuals with high willingness to pay are not necessarily the intended beneficiaries of government programs. Thus corruption results in inadequate targeting of social programs and leads to increased income inequality. Third, corruption tends to create 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. Fourth, empirical studies, for instance Persson and Tabellini (1994), routinely suggest that a higher growth rate is associated with a higher rate of poverty reduction and thus if corruption increases income inequality, it will also reduce growth and thereby limit poverty reduction. In particular, economic growth is harmed because high income inequality creates pressures either for populist programs, which reduce the overall productivity of public

[27] In this way, bribes can be assumed to clear the market since they reflect individuals' willingness to pay or their opportunity cost. However, this view, similar to the early efficiency-enhancing view of corruption ignores that corruption may create permanent distortions in income distribution.

[28] There are strong indications that the changes in income distribution that have occurred in recent years in previously centrally planned economies have partly been the result of corrupt actions.

resources, or for postponing much needed adjustment to support the growth process. Fifth, corruption also leads to increased income inequality through biased tax systems. Corruption accompanied by tax evasion, poor tax administration, and exemptions disproportionately favors the well-connected and wealthy population groups and hence reduce the tax base and the progressive tax system. Lastly, corruption is responsible for distortion of income distribution through other routes, such as human capital formation, education inequalities, and uncertainty, among others.

In recent empirical studies, this distributional consequence of corruption is clear in the data. For instance, Gupta, Davoodi, and Alonso-Terme (2002) present evidence that high and rising corruption increases income inequality and poverty. Specifically, an increase of one standard deviation in corruption increases the Gini coefficient of income inequality by about 11 points. In addition to the variability of corruption, the severity of income inequality also depends on its persistence. The distributional consequences of corruption are likely to be more severe the more persistent the corruption. The empirical relationship between corruption and income inequality is found to be considerably robust. Even in developed countries, this relation is clear in the data. For example, using state-level data, Glaeser and Saks (2006) show that the level of corruption is also correlated with the level of income inequality in United States. Therefore policies that reduce corruption will most likely lower income inequality and poverty as well.

## 5. MEASURING THE MAGNITUDE OF CORRUPTION

While theories abounded, a lack of data on corruption to test the theoretical studies allowed conflicting theories on the causes and consequences of corruption to coexist. More recently, an emerging body of empirical research by employing corruption measures has begun to appear.[29)]

[29)] These data sets were originally produced for business related purposes, such as *Business International* and *World Competitiveness Report*.

In this section, we begin by discussing subjective measures of corruption, which have been widely used in the literature, and their potential drawbacks. Next, we develop a new corruption measure based on a set of fundamental variables that are publicly available.

Quantitatively evaluating differences in the level of corruption across countries is a difficult task, both due to the secretive nature of corruption and a number of forms it takes. However, since corruption reflects underlying economic and institutional environment, different forms of corruption are likely to be correlated. The past decade has seen an exponential growth in cross-country studies on corruption as several corruption measures become available. Most studies have exploited the measures of corruption based on the perception of corrupt activities in a country. Indices of corruption produced by a variety of rating agencies are typically based on standardized questionnaires. Obviously, the replies are subjective, but the correlation between indices produced by different agencies is considerably high, suggesting that most observers more or less agree on how corrupt countries seem to be. Therefore, these subjective measures of corruption are apparently imperfect due to their subjective nature, but may provide useful insights.

Data on the perceived level of corruption from a cross-section of countries have been fruitfully introduced into empirical research lately focusing on a large variety of studies on the consequences and causes of corruption. It includes research on the impact of corruption on investment, national income, price stability, institutional quality, government expenditure, poverty, and international flows of capital and goods. Research on the causes of corruption focuses on the absence of competition, policy distortions, political systems, public salaries as well as an examination of colonialism, gender, and other cultural dimensions.

### 5.1. Conventional Measures of Corruption

Empirical research on corruption to discover the causes and consequences

of corruption is a relatively new endeavor. In this attempt, a number of studies have concentrated on cross-country analysis based on various corruption measures that are to large extent subjective assessments of the level of corruption. Such corruption perception measures are commonly regarded as a good indicator of the real level of corruption. In this regard, the current empirical studies on corruption exclusively rely on the subjective measures of corruption. Those corruption perception indices are based on the surveys of international business people, expatriates, risk analysts, and local residents. The use of a corruption perception index is justified because the actual level of corruption in a country is difficult to observe. Several attempts to quantify the magnitude of corruption have been made as follows.

Essentially, there exist three types of corruption measures, mostly subjective ones, commonly employed in the literature. First, private risk-assessment firms produced corruption indicators.[30] As an example, the corruption indicator published in the International Country Risk Guide captures the likelihood that government officials will demand special payments and the extent to which illegal payments are expected throughout government tiers.[31] Next, alternative approach to corruption measures using a micro-level data set has been made to create relatively more direct measure of corruption. For example, Fisman and Gatti (2000) and Goel and Nelson (1998) utilized the number of public officials convicted for abuse of public office in various states of the United States as an indicator for actual levels of corruption.[32] Mocan (2008) also used a set of variables from 49 countries to create a direct measure of corruption, which portrays the extent of bribery as revealed by individuals who live in those countries. Other studies that employ a micro-level data set include Swamy, Knack, Lee, and Azfar (2001)

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30) For example, Knack and Keefer (1995) and Mauro (1995), among others, used this type of corruption indicators in their studies.

31) Strictly speaking, the corruption indicator published in the International Country Risk Guide does not determine a country's level of corruption *per se*, but the political risk involved in corruption.

32) Goel and Nelson (1998) relate this variable to the real per capita total expenditures of the local government, arguing that state intervention and public spending give rise to rent-seeking activities and hence corruption.

and Svensson (2003).[33] Finally, the third type of corruption measures is averages of ratings reported by a variety of perception-based sources, which is relatively indirect way of measuring corruption. Growing body of empirical research on corruption has used this type of subjective measures mainly because a direct measure of corruption, such as the number of prosecuted corruption-related cases, may be rather noisy measures.[34] Among this class of corruption measures, Corruption Perception Index produced by Transparency International is probably the most popularly employed one. This indicator assesses the perception of corruption on a scale of 0 to 10.[35] This is a composite index including many other sources, such as the Political Risk Service, the Institute for Management Development, the World Bank, and the World Economic Forum.[36] On the other hand, Kaufmann, Kraay, and Mastruzzi (2004) proposed a complementary measure, Control of Corruption, drawn from a larger set of data sources. They have a broader definition of corruption and include most cross-country indices reporting ranking of countries on some aspect of corruption.[37]

The conventional measures of corruption, in particular indicators based on perceptions, have significant drawbacks.[38] Most of all, as we pointed out

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[33] It is worthy of note that this approach to measure the degree of corruption has a serious shortcoming. In section 2, we pointed out corruption can be divided into two major categories, illegal activities accompanied by the payments received from the public and misallocation of government resources for personal gain. This type of corruption measures inherently rule out the latter case, which potentially is more important aspect of corruption.

[34] For example, a low arrest rate for bribery may indicate a low prevalence of corruption or it may indicate widespread corruption with no prevention efforts. That is, conviction rates are not an adequate indicator for the actual incidence of corruption, but rather, reflect the quality of the judiciary (Goel and Nelson, 1998).

[35] Ten refers to a corruption-free country and zero refers to a country where most transactions or relations are tainted by corruption.

[36] For a description of these sources, see Lambsdorff (1999) and Mauro (1995). Note that the sources that the Corruption Perception Index is based on vary from year to year. According to Transparency International, the essential conditions for inclusion are that a source must provide an ordinal measurement, or ranking, of nations and that the data must measure the overall extent of corruption and not the expected impact.

[37] Note that Kaufmann, Kraay, and Mastruzzi (2004) also use a different strategy than Transparency International to aggregate the corruption indicators. However, they found that definitions and aggregation choice matter only marginally as the simple correlation between Control of Corruption and the Corruption Perceptions Index is 0.97.

[38] See, for example, Bardhan (1997), Dreher, Kotsogiannis, and McCorriston (2007), and

earlier, those indices reflect perceptions and not objective and quantitative measures of actual corruption in spite of their highly correlated fashion. Although it is hardly likely that the perception changes drastically, widely reported cases of corruption in a country may easily change perceptions in that country. On the other hand, according to Dreher, Kotsogiannis, and McCorriston (2007), they may suffer from artificial persistence. That is, once a country is reported to be corrupt, perception about that country may not change, leading future survey respondents to over-estimate true corruption. This suggests that a perception-based index may not correctly assess the extent of corruption in a country in the sense that the correlation between perceived corruption and actual corruption would be low.[39] Second, the subjective corruption measures are ordinal indices, not cardinal measures. The rankings of countries as more or less corrupt are based on subjective judgments and as such cannot be used to quantify the magnitude of corruption. Therefore this limitation should be kept in mind when interpreting changes in the indices across time and countries. Third, with regard to relatively direct measures of corruption, simply measuring bribes paid, for example, would ignore many corrupt activities that are not accompanied by the payment of bribes. Moreover, in general, an attempt to measure acts of corruption requires information that is not available. Lastly, the conventional indicators do not relate directly to the factors that are responsible for causing corruption.

### 5.2. New Measure of Corruption

Ideally, measures of corruption must consist of objective evaluations that are comparable across countries and over time. Such ideal measures do not

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Tanzi (1998), for more detailed discussion. Particularly, Dreher, Kotsogiannis, and McCorriston (2007) employed a structural equation model and treat corruption as a latent variable that is directly related to its underlying causes and effects to derive an index of corruption.

39) Recent studies indicate that perceived and actual corruption are completely unrelated (Mocan, 2008; Svensson, 2005) and thus surmise that perception-based indices reflect the quality of a country's institutions rather than its actual degree of corruption.

as yet exist. Therefore it is imperative to develop an alternative approach that provides a meaningful and comparable estimate of corruption across countries.

One of serious shortcomings of conventional, mostly subjective, corruption measures is that they are not directly related to causes of corruption. As a consequence, those indicators may not correctly represent actual magnitude of corruption. In section 3, we argued that the dominant source of corruption is government centralization. Thus, in this study, we utilize the degree of government centralization to estimate the size of corruption. In order to achieve this goal, there are two major empirical issues. They are measuring the level of government centralization and deciding empirical specification for estimating the size of corruption in a country.

With regard to the measurement of government centralization, we essentially follow the literature that examines the relationship between government budget structure and corruption. In fact, most studies that examine the effects of government on corruption have concentrated on the size of government customarily measured by expenditures of government in a country. However, the effect of government size on corruption is mixed in the literature. For instance, using U.S. state-level data, Goel and Nelson (1998) demonstrate that government size, in particular spending by state governments, has a strong positive influence on corruption whereas Glaeser and Saks (2006) suggest that the level of corruption is virtually uncorrelated with the size of government. On the other hand, some studies show that the composition of government spending plays an important role in explaining the level of corruption. For instance, Mauro (1998) studied whether predatory behavior by corrupt politicians distorts the composition of government expenditure. Therefore, instead of using the absolute magnitude of government size, we employ a reasonable measure of government centralization, the ratio of central government expenditure to total government spending.

Next, a simple empirical model for estimating the magnitude of corruption will be developed using the methodology of estimating underground

economy. We employ this empirical strategy for the following reasons. First, underground economy and corruption have in common in terms of their secret nature. In addition, as we discussed in section 2, there is a strong positive relationship between underground economy and corruption and underground encompasses corrupt activities. In other words, the magnitude of corruption may be interpreted as a subset of underground economy.[40] Second, most models estimating underground economy are simple in the sense that those models exploit macroeconomic variables that are readily accessible and hence are amenable to empirical analysis. Finally, by adopting such a simple model that uses economic fundamental variables, we can access publicly available long time-series data, albeit limited, allowing us to address the question of whether corruption has increased or decreased over time. Furthermore, this measure provides not only an ordinal ranking of corruption across countries but it also renders a meaningful measure of distance between countries.

### 5.2.1. The model

Since the 1970s, the nature and size of the non-measured economy, both the informal and the illegal one, has been actively studies. Several models to estimate underground or shadow economy have appeared in the literature, each with its own theoretical pros and cons. The conventional methods made use of the difference in accounted incomes and expenses, changes in labor force, or electricity consumption, among others.[41] In this study, we follow the monetarist approach developed by Feige (1979) and Tanzi (1983) who suggest the overall excess of money supply was unrecorded money used in the underground economy and tax rate plays an important role in determining

[40] Johnson, Kaufmann, and Shleifer (1997) found that, in post-communist economies, underground economy's share of GDP is determined by the extent of control rights held by bureaucrats and politicians. The underground economy accounts for a larger share of GDP where there is great bureaucratic inefficiency and discretion, and where firms experience a greater tax and regulatory burden, as well as more bribery and corruption.

[41] See Walter (1991) for a comprehensive survey on the estimation of underground economy.

the size of underground economy.[42] Apparently, this methodology is not free of potential drawbacks. For instance, this method highlights just one factor in order to capture all effects of the underground economy. Nonetheless, this approach is adopted because it can directly incorporate the most important cause and is simple enough to analyze the dynamic and cross-sectional behavior of corruption and underground economy. Moreover, it allows us to obtain relatively longer period of publicly available time-series data.

Estimating underground economy focuses on currency-deposit ratio because the presence of underground economy is mainly due to tax evasion incentives. That is, tax rate as a means to evaluate the size of underground economy can be used because a higher tax rate is responsible for increasing the size of underground economy. Similarly, the magnitude of corruption depends on the degree of government centralization. This is simply because, according to our definition of corruption, there will be no corruption, if government does not exist. Let us define $C_r$ and $C_u$ as currency circulated in official or regular market economy and in underground economy or shadow economy, respectively. Then, the underground-official economy ratio ($\lambda_1$) and currency-deposit ratio ($\frac{\partial \lambda_2}{\partial \tau} \approx \frac{\partial \lambda_1}{\partial \tau}$) are

$$\lambda_1 \equiv \frac{C_u}{C_r + D}, \tag{1}$$

$$\lambda_2 \equiv \frac{C}{D} = \frac{C_r + C_u}{D}, \tag{2}$$

where $M$ is monetary aggregate, measured as M1 ($\equiv C + D$), $C$ is currency, and $D$ is demand deposit. It is worth noting that either equation (1) or (2)

[42] Some recent studies argued that the relationship between taxes and the demand for cash money is not time robust due to change in financial conditions.

can be used since there would be little substitution between $C_r$ and $C_u$ as tax rate or government centralization changes whereas the substitution between $C_u$ and $D$ occur to a large extent. That is, let $\tau$ and $\zeta$ denote income tax rate and the degree of government centralization, respectively. Note that $\frac{\partial \lambda_2}{\partial \tau} \approx \frac{\partial \lambda_1}{\partial \tau}$ and $\frac{\partial \lambda_2}{\partial \zeta} \approx \frac{\partial \lambda_1}{\partial \zeta}$.

In order to measure marginal effect of tax rate and government centralization on $\lambda$, which are considered as the dominant factor of underground economy and corruption, respectively, we construct a statistical model as follows.

$$\lambda(\tau,\ \zeta,\ X) = \alpha + \beta\tau + \gamma\zeta + \delta X + \varepsilon, \tag{3}$$

where $X$ is a vector of other explanatory variables. Thus underground and official economy ratio can be found by

$$\hat{\lambda}(\tau) - \hat{\lambda}(\tau = 0) = \hat{\beta}\tau. \tag{4}$$

Likewise, the magnitude of corruption relative to economy without corruption is given by

$$\hat{\lambda}(\zeta) - \hat{\lambda}(\zeta = 0) = \hat{\gamma}\zeta. \tag{5}$$

Following the suggestions by a number of studies that suggest M1 is no longer be a proper measure as financial conditions have changed, we use M2 instead of M1 and hence $\lambda \equiv \frac{C_r + C_u}{M2}$. Lastly, using the fact that $\frac{\partial \lambda}{\partial \tau} = \beta$ and $\frac{\partial \lambda}{\partial \zeta} = \gamma$,[43] the amount of currencies circulated in underground economy

[43] Tanzi (1999), among others, used the same approach to interpret the slope coefficients of the model.

and that is associated with corruption[44] can be estimated by

$$\hat{C}_{\tau} = \hat{\beta} \cdot \tau \cdot M2, \tag{6}$$

$$\hat{C}_{\zeta} = \hat{\gamma} \cdot \zeta \cdot M2. \tag{7}$$

Accordingly, the magnitudes of underground and corruption economy relative to national income measured as real GDP can be obtained by using the estimate of $C_{\tau}$ and $C_{\zeta}$, which will be discussed later.

### 5.2.2. Data and empirical results

By applying the empirical specification above, we estimate the magnitude of corruption and underground economy for Korea using annual observations spanning from 1970 to 2006. The sample period is picked mainly due to the availability of data. In order to estimate the empirical model given by (3), we must specify explanatory variables, the degree of government centralization and other fundamental variables that potentially affect $\lambda$. First, there is no such a variable that directly measures the degree of central government concentration. In accordance with our earlier deliberation, we use income transactions of central government to general government as a proxy for the degree of government centralization, which is obtained from National Accounts published by the Bank of Korea. For other explanatory variables, we employ conventionally used variables that are primarily determinants of money demand.[45]

Accordingly, we consider the following empirical model,

$$\lambda_t = \alpha + \beta\tau_t + \gamma\zeta_t + \delta_1 Y_t + \delta_2 i_t + \varepsilon_t, \tag{8}$$

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[44] Alternatively, $\hat{C}_{\zeta}$ can be interpreted as the amount of currencies coming into the underground economy due to corruption.

[45] The data for those variables are from *International Financial Statistics* (IFS).

where, $Y$ is the logarithm of real GDP and $i$ is interest rate in percent, and the estimation result is[46)]

$$\underset{\quad (2.41)}{\lambda_t = 0.353} + \underset{(4.65)}{0.154\tau_t} + \underset{(2.49)}{0.022\zeta_t} - \underset{(-6.56)}{0.041Y_t} - \underset{(-3.63)}{0.187 i_t}. \tag{9}$$

Note that, as a goodness-of-fit measure, $\bar{R}^2 = 0.940$ is impressively high and $F = 138$ is large enough to reject the hypothesis that coefficients are all zero. In addition, all estimates are significantly different from zero and the signs are consistent with what the theory suggests.

To calculate the size of corruption and underground economy, we use estimates of $\hat{\beta}$ and $\hat{\gamma}$ and equations (6) and (7) to get $\hat{C}_{\tau,t}$ and $\hat{C}_{\zeta,t}$. Next, let's define $\Delta_{1,t} \equiv \hat{C}_{\tau,t} / (M_t - \hat{C}_{\tau,t})$ and $\Delta_{2,t} \equiv \hat{C}_{\zeta,t} / (M_t - \hat{C}_{\zeta,t})$. Then the magnitude of underground and corruption economy is given by

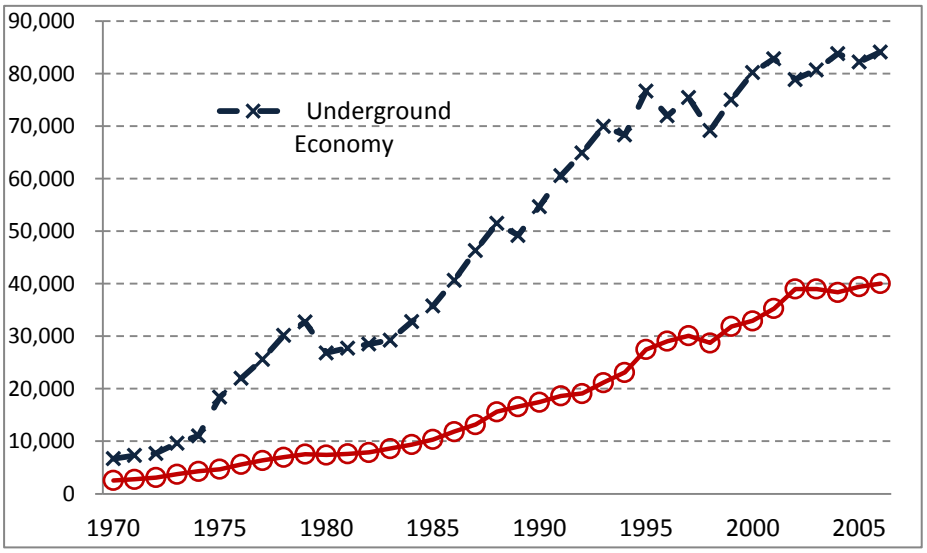
$$SIZE_t^{\tau} = \Delta_{1,t} \cdot RGDP_t, \tag{10}$$

$$SIZE_t^{\zeta} = \Delta_{2,t} \cdot RGDP_t. \tag{11}$$

The estimated sizes of underground economy ($SIZE_t^{\tau}$) and corruption economy ($SIZE_t^{\zeta}$) are presented in figure1. In accordance with the existing literature, the magnitudes of corruption and underground economy are substantial. For instance, as of 2005, the underground economy is 82.2 trillion Korean Wons (10.14% of real GDP) and 39.4 trillion Korean Wons (4.86% of real GDP).

46) The numbers in parenthesis refer to *t*-value.

**Figure 1 The Sizes of Underground and Corruption Economy**



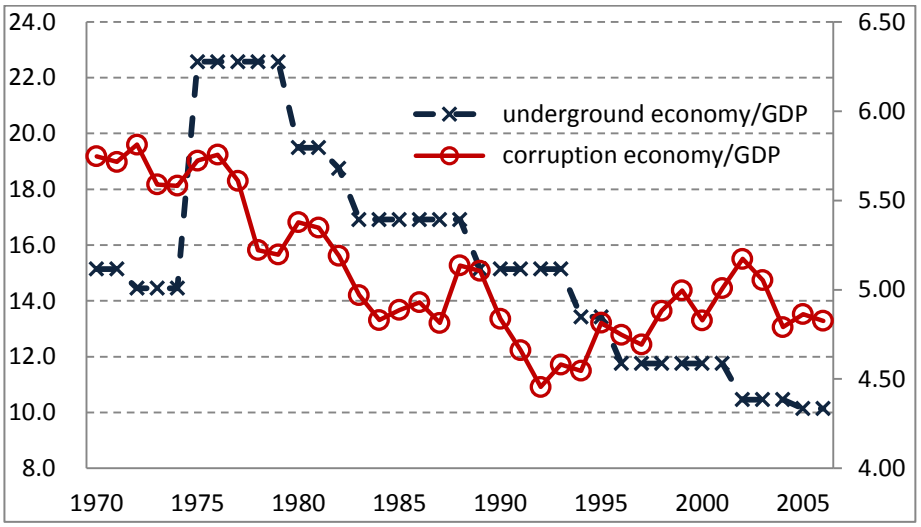

Note: This figure plots the magnitudes of corruption (solid line) and underground economy (dotted line) in billion Korean Wons at 2005 constant prices.

### 5.2.3. Discussion

The estimated magnitude of corruption in Korea has several important implications. First of all, corruption is indeed a persistent feature of human society over time. Corruption is both pervasive and significant in Korea as it amounts to a large fraction of national income. As we discussed earlier, corruption is also common in developed countries. The estimated corruption size that exhibits sustained growth clearly suggests economic development does not necessarily imply a substantial decrease in the level of corruption. Not surprisingly, the size of underground economy displays the same pattern, long-run upward trend. Therefore we conclude that, although there seems to be negative relation between economic growth and corruption, no single action such as higher economic growth is enough to reduce the level of corruption.

With regard to the relation between corruption and underground economy, corruption decidedly is a subset of underground economy, which is consistent

**Figure 2 Corruption and Underground Economy Relative to Real GDP**




Note: This figure plots the magnitudes of corruption (solid line; right scale) and underground economy (dotted line; left scale) relative to real GDP.

with the fact that corruption centers on the exploitation of public or government power whereas underground economy include both private and public aspects of corruption. Next, corruption is found to be less volatile than underground economy.[47] This suggests that a change in rules, regulations, tax administration policies, and tax structure considerably influence the size of underground economy, but may have little effect on corruption. Thus, without major changes in government structure, it is hard to reduce the intensity of corruption.

In order to examine how corruption and underground economy in Korea have evolved, we use $\Delta_{1,t}$ and $\Delta_{2,t}$ in equations (10) and (11), which measure the size of underground and corruption economy relative to real GDP, respectively and they are presented in figure 2. First, the relative size of underground economy (left scale) clearly has been decreased since the late 1970s. The ratio peaked in the late 1970s (23%) and marked about 10% in

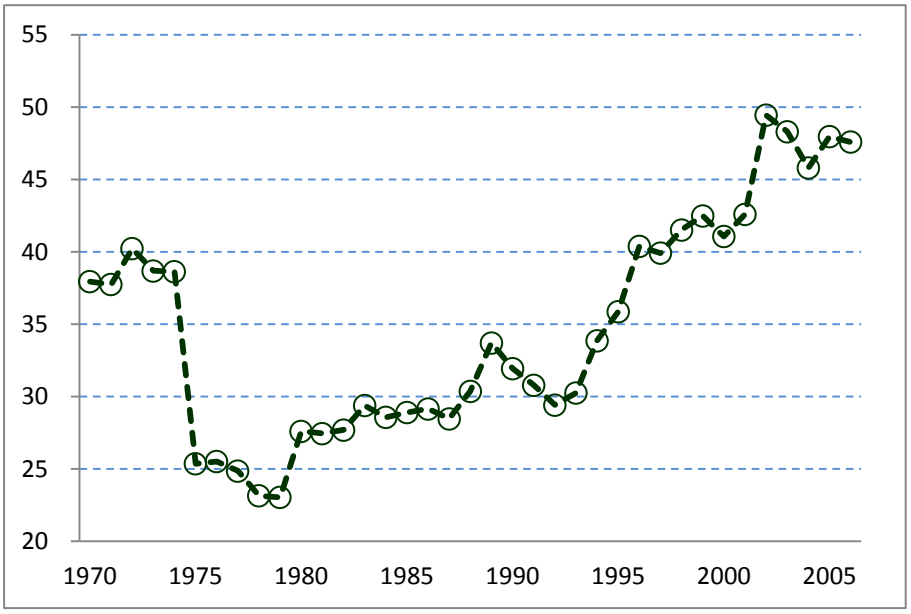
[47] While corruption displays virtually no cyclical pattern, the magnitude of underground economy appears to be procyclical to some extent.

2006. On the other hand, the magnitude of corruption relative to real GDP (right scale) does not exhibit such a pattern as the relative size does not move systematically. It has been around 5% during the entire sample period, 1970-2006. This finding that corruption is highly persistent in Korea suggests past efforts in reducing corruption have not been successful in all respects. Next, the relative size of corruption tends to increase after early 1990 as opposed to underground economy, although it has displayed a downturn since the early 2000s. This comes as a surprise because this period is commonly characterized as the accelerating trend of globalization in Korea whereas there is recognition that globalization and world economic integration help reduce the level of corruption. Moreover, there appears to be another puzzling feature that the intensity of corruption did rise during financial crisis in late 1990s.[48] We believe that the fundamental reason why the magnitude of corruption increased in those periods is that, in order to overcome the economic crisis, the leading role of government might be excessively emphasized and, as a consequence, create stronger incentives for the abuse of public power.

Finally, we also examine the relationship between corruption and underground economy in terms of their relative shares. Most of all, as shown in figure 2, there seems no potent correlation between them. Figure 3 also plots the relative share of corruption in percentage of underground economy. Contrary to popular belief that reducing the size of underground economy will be associated with lower level of corruption, the relative share of corruption in Korea has been persistently increased since the late 1970s and reached about 50% in the early 2000s. This finding must be interpreted with extreme caution. This long-run upward trend is not due to sustained rises in the magnitude of corruption. This is because of substantial decrease in the size of underground economy clearly seen in figure 2 while the level of corruption has not been significantly changed. Therefore we conclude that,

[48] As a relevant study, Bliss and Di Tella (1997) reported that practical experience seems to show that countries that have increased levels of competition in the economy have sometimes experiences upsurges in corruption.

**Figure 3 The Magnitude of Corruption Relative to Underground Economy**




in Korea, the efforts to reduce underground economy such as effective regulatory and tax administration have been quite successful. Notwithstanding their similarities, the necessary actions to control corruption may differ enormously.

## 6. CONCLUDING REMARKS

Corruption is a persistent feature of human societies over time and space. Without doubt, no country is free of corruption. The many factors that contribute to corruption tend to be more common in poorer countries than in rich countries. However, at similar levels of development, some countries are perceived to have higher level of corruption than others. Despite a fairly clear understanding of the causes and economic effects of corruption, the

magnitude of corruption has proved to be remarkably persistent.

In this paper, as a starting point, we reviewed recent developments in the economic literature on corruption. We conducted an extensive survey of definitions, causes, and economic effects of corruption in a variety of aspects. A general consensus about the dominant factor that drives corruption is found to be excessive centralization of government expenditure. With regard to economic consequences of corruption, although there exists a line of research that suggests some positive effects of corruption on economic efficiencies, recent fairly broad agreement seems to be that corruption has adverse effects on economy in any respect. In particular, corruption impairs economic efficiencies and, as a result, reduces private investment and economic growth. In addition, corruption has distributional consequences, which seem to affect an economy's social welfare more seriously.

Another potentially important contribution to the existing literature on corruption has made by developing new measure for the size of corruption. This is motivated by the fact that conventional measures of corruption are based on the perception of corrupt activities in a country. By their subjective nature, those measures are inherently imperfect and hence make it difficult to provide a quantitatively meaningful and comparable estimate of corruption. We develop an empirical model that directly relates the main factor causing corruption to the magnitude of corruption. The empirical results for Korea are able to explain a number of important features. For instance, the magnitude of corruption is substantial, highly persistent, and is not directly related to underground economy, among others. More importantly, corruption is found to be not vulnerable to conventional efforts to reduce its intensity.

With well-focused and determined efforts, corruption may be reduced, though not to zero because completely eliminating corruption would be too costly.[49] As we argued that excessively centralized government in national

[49] As a relevant study, Bliss and Di Tella (1997) reported that practical experience seems to show that countries that have increased levels of competition in the economy have sometimes experiences upsurges in corruption.

level may be the ultimate factor that drives the high level of corruption, an approach to corruption control would be increasing competition to reduce the returns from corrupt activities. However, in practice, this remedy is not that simple, as Bliss and Di Tella (1997) pointed out that countries that have increased levels of competition in the economy have sometimes experiences upsurges in corruption. Thus the important point is that even when a policy on competition is a simple instrument for controlling corruption, economists still have not fully identified the conditions under which an increase in competition will effectively reduce corruption. Countries can do much to reduce the intensity of corruption, but no single action will achieve more than a limited improvement and some of the necessary actions may require major changes in existing policies.

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