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Fiscal Decentralization and Corruption in the Public Sector

Bayar Tumennasan

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FISCAL DECENTRALIZATION AND CORRUPTION IN THE PUBLIC SECTOR

BY

BAYAR TUMENNASAN

A Dissertation Submitted in Partial Fulfillment
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ACCEPTANCE

This dissertation was prepared under the direction of the candidate's Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Economics in the Andrew Young School of Policy Studies of Georgia State University.

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TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

FISCAL DECENTRALIZATION AND CORRUPTION IN THE PUBLIC SECTOR

BY

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This dissertation explores the relationship between fiscal decentralization and corruption. Theoretically, it is shown that decentralization has a potential to induce public officials to reduce the bribes they charge from entrepreneurs. That would encourage firms to enter the economy. Consistent with the theoretical model, we find empirical evidence that suggests that fiscal decentralization causes public officials to reduce the bribes they charge per firm; thus decentralization lowers the bribery cost to entrepreneurs. Empirical analysis is based on cross country study and panel data study where appropriate.

Secondly, not all aspects of fiscal decentralization have an equal impact on corruption. Based on a cross state analysis, we find that states that decentralize revenue raising authority and give more revenue authority to local governments were perceived to be less corrupt. Cross state analysis is appealing because many of the political and institutional factors are held fixed.

Overall, the findings suggest that fiscal decentralization can potentially help to control public corruption and create favorable conditions for the private sector. If revenue authorities are devolved to subnational levels, then the effect might be even greater. The effects of various aspects of decentralization on corruptibility of government and the quality of public office have not been tested before and are of great interest to policymakers. These finding are of great interest to developing and transition countries trying to control corruption.

CHAPTER I. INTRODUCTION

The issue of corruption started to receive an increased attention of economists from the new interest in the role of government in development, especially in developing and transition countries. “People living with ineffective states have long suffered the consequences in terms of postponed growth and social development,” and now there is a general consensus among economists and policy makers that corruption-free government is necessary for development, not the other way around (World Bank 1997).

One of the trends in fiscal reform is advocating fiscal decentralization, especially in developing and transition countries. The attributes of successful decentralization such as increased bureaucratic competition and greater transparency could be keys to a successful economic approach against corruption (Jain 2001; Martinez-Vazquez and McNab 2003; Rose-Ackerman 1997; Shleifer and Vishny 1993). The question that is raised in my dissertation is whether fiscal decentralization can reduce the opportunities for corruption in the public sector.

What is corruption? Corruption is a broad concept. Examples of corruption--from match-rigging in sumo wrestling Duggan and Levitt (2002) to illegal privatization schemes in the 1990s in Russia Klebnikov (2000)--are abundant. The corruption cases in different sectors or different countries are not all the same. What people call corruption in some societies may well be the norms in others (de Sardan 1999). Also, people have different views of corruption depending on the sector of the economy where it occurs, i.e., corruption of courts is viewed as more problematic than embezzlement (Transparency International 2002). Therefore, it is necessary to limit our focus of study to particular aspects of corruption. The commonly used definition of corruption comes from

the World Bank. They define corruption as an abuse of public office power for private gains. This definition is simple yet broad enough to capture most forms of corruption in the public sector.

What does a public officer do that can be called abuse of public office power for private gain, and how? The public sector is run by numerous bureaucrats and governed by elected or appointed officials. Some of them may engage in some form of corruption such as bribery, embezzlement, extortion, or favoritism (Admundsen 2000). Corruption can take place on revenue side or expenditure side of the budget, or outside the budget in quasi-fiscal transactions such as the imposition of regulations (Martinez-Vazquez et al. 2004). The way they engage in corrupt activities can differ structurally as well. Corruption can be grand, mostly practiced by high level officials or petty, which common among lower level bureaucrats; corruption can be organized, just like in a criminal syndicate or competitive with not clear organization (Celentani and Ganuza 2002; Waller et al. 2002).

Let us briefly overview the forms of corruption. First, a major form of corruption is embezzlement, which is a theft of public resources. This is a classic example of corruption on expenditure side of the budget. In some countries embezzlement is a major problem (Transparency International 2004c). State officials steal from the public institution where they are employed, or even the leaders steal from the treasury. For example, during his years in power, Mohamed Suharto of Indonesia allegedly stole up to $US35 billion from the country (Hodess et al. 2004). As far as the sum of money embezzled goes, the Suharto case is an extreme. But embezzlement of public resources is a common problem. When everybody steals small amounts the consequences can be as

negative as when the leader steals big. For example, during the last few decades before the collapse of the Soviet Union, vast amounts of public resources were regularly stolen by factory workers, office workers etc. (Silber 1994).

Another form of corruption is extortion. Usually extortion is associated with organized criminals who impose their influence on government officials or businesses through threats and intimidations. For example, the "mafia" may obtain preferential business opportunities or freedom from taxation and legal prosecution by blackmailing certain state officials. But the opposite can happen. Government officials may extort money from individuals and businesses through threats of strict taxation, delays in issuing licenses, police inspections, or sanitary inspections. That is especially true in countries with a weak rule of law. In those countries the government officials may even have an incentive to further complicate the rules and regulations with sole purpose of being able to selectively enforce those rules and extort money from the businesses and individuals (Admundsen 2000).

Besides, corruption does not have to be associated only with money. Corruption can and does take the form of favoritism, which is a disposition to favor and promote the interest of one person or persons to the disregard of others having equal claims. Privatization, natural resource exploitation, regulations also provide ample opportunities for officials to play favorites and extract personal gains. Nepotism is another form of favoritism. A classic example of nepotism is hiring and promotion of individuals based on family or other personal relations rather than merit. This form of corruption also involves public office power to hire or promote someone. The person who abuses that power benefits from it, although not necessarily in monetary terms (Admundsen 2000).

Money laundering, tax evasion, black market activities, or drug trafficking are not of interest in this study, because they do not necessarily involve abuse of public office (Jain 2001). For example, counterfeiting, telemarketing or internet scams do not have to involve any elected official or civil servants. These are mostly illegal activities by private agents, and you do not have to be a public official to engage in these types of criminal activities.

Lastly, bribery is one the more common form of corruption. Bribery can accompany corruption on either side of the budget, and outside of it as well. Individuals or organizations offer bribes to government officials who can make contracts on behalf of the state or make decisions on using public funds to influence their decisions regarding particular tasks. Bribes are also known as kickbacks, gratuities, pay-offs, grease money etc. Outside the budget, the privatization process can be greatly influenced by bribery (Klebnikov 2000). On the revenue side of the budget, tax collection agents can accept bribes to lower the tax liabilities of bribe offering individuals or businesses. Encyclopedia Britannica defines bribery as "the act of promising, giving, receiving, or agreeing to receive money or some other item of value with the corrupt aim of influencing a public official in the discharge of his official duties. When money has been offered or promised in exchange for a corrupt act, the official involved need not actually accomplish that act for the offense of bribery to be complete. The crime is typically punishable as a felony." Bribery is a classic form of corruption, and it conforms to the definition of corruption by the World Bank. There is an official who abuses his public office powers entrusted with him to gain private monetary benefits in form of bribes.

For the analysis of public corruption within the scope of this thesis, we narrow the definition of corruption to bribery. According to the Bribe Payers Index Transparency International (2002), officials in the public works and the construction sector were the most likely to demand or accept bribes, followed by the arms and defense, oil and gas sectors. The biggest bribes are likely to be paid in public works and construction sector, followed by arms and defense sector. These sectors are all major components of the economy and the government is usually responsible for them in most of the countries.

Now let us shift to the question of who acts in a corrupt manner. First, corruption is called "grand" when high level public officials abuse their power for personal use (Transparency International 2004c). In other words, grand corruption occurs when those who are entitled to formulate, establish and implement the laws in the name of the people, or who have decision-making power over processes of significant economic value, are themselves corrupt, and use the political power they are entrusted with to sustain their power and wealth. It is when policy formulation and legislation is tailored to benefit politicians and legislators. "From outright vote-buying to selling preferential access, political corruption presents a significant challenge," and corruption of the political process has a severe damaging effect on democracies around the world (Transparency International 2004b). Corrupt practices such as acceptance of bribes or kickbacks from those who seek government tender and procurements may qualify as grand corruption as well. As we go down the chain of command, we may observe "petty" corruption.

Petty, also known as administrative or bureaucratic, corruption is found among underpaid civil servants who in many countries often have to depend on small

contributions from the public to meet their basic needs. An example of this type of corruption is an acceptance of bribes for issuing licenses, passports, or providing basic public service. Letting a briber ahead of line on a waiting list for setting up a basic telephone line is a common petty corruption in less developed countries, where the public utilities are in a short supply (Clarke and Xu 2004). Although petty corruption is more noticeable, people are more concerned about the consequences of grand corruption. When asked what institution they would prefer to see free of corruption, people choose the courts, political parties, customs and police, rather than utilities or passport offices (Transparency International 2002). People consider grand corruption a more serious problem than petty corruption (Transparency International 2004c). Maybe it is because people do not directly benefit from grand corruption, whereas petty corruption allows people to avoid inefficient bureaucracy. Explaining why people see grand and petty corruption differently would be an interesting future research question.

How the corrupt officials operate is another interesting question. Corruption takes a bottom-up structure when the lower level officials set the bribe rate and collect bribes and then share the illegal incomes with the higher ranking officials. Higher officials in turn close their eyes and enforce the law only when the lower level officials fail to share their revenues. In other words, if bureaucrats act in such a way as to maximize their own individual utilities one will observe a competitive bottom-up corruption. On the other hand when higher level official coordinates the bribe rate and collects the bribe revenues and gives shares to the lower levels, we call that top-down corruption. In this organized top-down corruption the higher level official will oversee the corruption decisions of the

population of bureaucrats in such a way as to maximize the total corruption proceeds (Waller et al. 2002).

Until recently, corruption was often overlooked and considered a taboo subject. Following (Leff 1964), there was even some tendency to view corruption as “grease” that helps to turn the wheels of commerce, especially in developing countries. Faced with rigid, inefficient and highly bureaucratic governments in less developed countries, the western companies often viewed bribery as a way around the system.

In some extreme cases, corruption may in fact have short term benefits for the economy. For example, faced with very high price inflation, due to administrative and delays and partial breakdown, government will find itself unable to raise the salaries to match the cost of living. Systematic bribery or illegal fees can be the only means by which the government keeps going (Morgan 1964). The rapid increase in corruption in transition economies during the economic downturn following the collapse of the centrally planned economic systems can be partly explained by the above argument. Corruption may have helped to keep the government going during the economically hard times. But as the economy stabilizes the corruption may not go away that easily.

It is hard to measure the costs of corruption quantitatively because of its secretive nature. But the World Bank Institute estimates that the corruption cuts around 4 percent off the world's economic wealth each year, worth about $US1 trillion. Transparency International estimates that at least $US400 billion is lost per year due to bribery in government procurement worldwide. There are some estimates of costs caused by individuals. According to the Transparency International, Ferdinand Marcos of Philippines embezzled up to US$ 10 billion during his presidency from 1972 to 1986.

Strikingly, another president of Philippines, Joseph Estrada, is on the list of top ten corrupt politicians. While serving as the president of Philippines from 1998-2001, he stole around US$80 million.

The above mentioned $US1 trillion in monetary costs are estimates of the amount of money spent on bribery only. This estimate does not capture lost opportunities for individuals, decrease in private investments, misuse of public funds, or reduction in basic public services that may result from corruption in government. Qualitatively the consequences of corruption are likely to be far more devastating for both the economy and society. Corruption undermines the purpose of government, and imposes enormous economic, political, and social costs.

The conventional justification for government intervention is correction of market failures. When markets fail (public goods, externalities etc.) the government steps in. But government can fail if it creates inefficient rules and regulations. Some people believe that corruption can correct the government failure by allowing individuals to avoid the inefficient regulations (Leff 1964). But, corruption does not distinguish between good and bad rules and regulations. Thus corruption is likely to fail to correct the government failure. Corruption diminishes the whole purpose of having the government because corruption distorts all three major functions of government, namely macroeconomic stabilization, income redistribution and resource allocation[1].

Different people respond differently to government interventions, such as taxation. For example, if someone does not want to pay taxes on alcohol, he either can avoid taxes by not consuming alcohol, or evade taxes by not paying the taxes, or corrupt

[1] According to (Musgrave 1959)the government has three economic functions, which include macroeconomic stabilization, income redistribution and allocation of resources.

the system by bribing the tax officer thus not paying taxes yet still consuming the alcohol. The difference between the last two is that with tax evasion you risk being caught cheating, while with corruption you try to reduce the probability of being caught if the anti-corruption policies that target those doing the bribing are not strict. If corruption is widespread then the incentive of most of the people is to corrupt the system to evade taxes. Consequently, the presence of corruption makes government policies ineffective, and with fewer people paying taxes the governments may raise tax rates to inefficient levels thus reducing the total tax revenues (Chander and Wilde 1992; Johnson et al. 2000; Litwack 2002; Sanyal et al. 2000).

On the expenditure side, corrupt government officials are likely to be interested in "white elephant" projects. It is apparently easier to hide thefts of public funds in outrageous budgets for huge infrastructure projects such as building of dams and roads. Tender, bidding, and procurement all provide ample opportunities to steal the money without the public knowing about it Transparency International (2005), whereas education and cultural activities are the areas where the officials see few opportunities to extract any benefits for themselves (Mauro 1998). Lower tax revenues combined with larger inefficient government expenditures lead to greater budget deficits, thus weakening the stabilization role of government.

Taxation naturally creates distortions in the economic system. But the taxation is justified on the grounds that the government uses the collected revenues to provide public goods. If tax revenues go to the corrupt individuals in charge of collecting taxes rather than the Treasury, then there is an even greater distortion. Thus on efficiency grounds the corruption is not desirable. Sometimes regressive taxes such as payroll taxes are justified

because the recipients of the social welfare programs are less wealthy ones. However, if the tax revenues go to the hands of corrupt ones, the taxation becomes more regressive. Generally, the real incomes of those who engage in corrupt activities increase relative to those who do not because tax structures are usually modified in favor of those who can influence the officials, thus leading to greater income inequality (Hindriks et al. 1999). When the corruption is widespread, the elected officials become less interested in financing social programs because they are likely to be interested in diverting and stealing the public resources for their own benefit, thus contributing to inequality and an increase in poverty.

Lastly, corrupt governments create unequal conditions for firms to operate by favoring bribe-paying businesses, for example, awarding government contracts or licenses not to the most efficient firms but to the ones that offer bribes Tanzi (1998a) or the ones that pay the greatest bribes. In some cases, virtually every firm is required to pay bribes just to stay in business. Thus corruption increases the cost of business to firms through the price of illicit payments, and the management cost of negotiating with officials. A heavy burden of corruption is also likely to drive businesses out of official sector into shadow economy (Friedman et al. 2000; Schneider and Enste 2000). Corruption also can make firms hide their output to dodge taxes and discourage foreign direct investments, because corruption worsens the environment in which private sector has to operate ((Johnson et al. 2000; Wei 1997b). In the public sector, by diverting public investment away from education into capital projects where bribes and kickbacks are more plentiful, officials create economic distortions (Mauro 1998). Choice of inefficient public investment projects undertaken by the government may slow down the economic

growth (Mauro 1995). Corruption also lowers compliance with construction, environmental, or other regulations, which will result in poor quality roads, bridges, etc. The human toll and economic devastation following the 1999 earthquake in Turkey, or the 2001 earthquake in India, could have been minimized had there been stricter inspection of buildings or the building codes had been followed. The endemic corruption in the construction sector was to blame for some the damages (Transparency International 2005).

Negative consequences of corruption in the public sector are not limited to the economic costs alone. Social costs of corruption are substantial. Corruption has a damaging effect on the quality of public services. Child mortality rates in countries with high corruption are about one-third higher than in countries with low corruption; infant mortality rates and percent of low-birth weight babies are almost twice as high, and dropout rates are five times as high (Gupta et al. 2000). That suggests that corruption distracts governments from fulfilling the obligations to maintain acceptable level of immunization and public health efforts. In other words, corrupt governments are not accountable to the people for providing substandard public health care and public education. But it is important to note that there might be some simultaneity in the corruption-bad outcome linkage. When social conditions are bad and there is little what the governments can do about it, there is a likelihood that the officials will not even try to improve the situation and try to steal while in the office.

Besides having a deteriorating effect on public health or education, corruption imposes political costs as well. Corruption of government erodes the institutional capacity of government as procedures are disregarded, resources are siphoned off, and

officials are hired or promoted with no regard to performance. Corruption undermines the legitimacy of government and such democratic values as trust and tolerance. There is a saying that "a fish rots from the head." When politicians and senior officials are corrupt, the public sees little reason not to be corrupt. If there is no political will at the higher levels of government to curb corruption, the epidemic is likely to spread to every layer of the society.

As we can see, corruption of government has far reaching implications for the whole country. Economic, political and social costs of corruption are enormous and any country would be better off without corruption. For example, if a country such as Egypt were to heighten the efficiency of its administration and improve its corruption score of 4 out of 10 to the same level as Argentina's 6, the rate of investment would increase by 3 percent and the growth rate would increase by 0.5 percent[2] (Mauro 1997). An increase in the corruption-induced uncertainly level from that of Singapore to that of Mexico, at the average level of corruption in the sample, is equivalent to raising the tax rate by 32 percentage points (Wei 1997a).

Clearly lower or no corruption is desirable for any country. But what can countries do to reduce corruption if corruption is already widespread? The literature suggests a number of ways to fight corruption. Mostly these suggestions can be divided into some combinations of "stick" and "carrot." Some advocate a tougher prosecution of corruption, while others suggest offering incentives not to engage in corruption. Although both of these are important tools in fight against corruption, they might be too costly and not as productive as one would hope for.

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[2] 0 means total corruption and 10 means none at all

Tougher prosecution of corruption requires extensive monitoring and creation of monitoring agencies. Most of the time the agencies are created at the central government level, and assuming the central governments are benevolent, they could be effective. Successful practices are creation of independent anti-corruption commissions. International anti-corruption watchdogs are becoming increasingly influential.

Lower wages may create incentives for government officials to engage in corruption to supplement their low official wage income. However, raising wages in developing countries may place a heavy burden on the budget. Often, a raise in public sector wages translates into higher inflation rates thus leading to no change in real wages. High income countries are likely to be able to afford to raise wages of civil servants sufficiently high enough to curb the incentive to accept bribes. For example, Singapore provides an example of successful anti-corruption effort using both tougher prosecution and higher wages. But we have to keep in mind that Singapore is a wealthy city state.[3] Small size and high per capita income make it relatively easier to monitor the officials and provide enough incentives to government officers to curb the corruption. The success story of Singapore is not easily replicated in other larger countries or countries with less income per capita.

Long term fix could be found in public sector reforms that would reduce the range and the value of transactions that can potentially be exploited by corrupt officials. The corruption literature stresses the importance of economic rents associated with investments and the strengths of political institutions in combating corruption (Jain 2001). Various fiscal and structural reforms are likely to influence the corruption. Given

[3] According to the (World Bank 2004), Singapore has a population of 4.1 million and GDP per capita $US 27,254 as of 2002.

the high level of corruption, countries could reform their fiscal systems to reduce the costs of corruption. For example, in the presence of corruption consumption taxes are preferred to income taxation (Alm and Barreto 2003).

As we've mentioned earlier, one of the trends in fiscal reform is advocating fiscal decentralization in developing and transition countries. The attributes of successful decentralization such as increased bureaucratic competition and greater transparency are the keys to a successful economic approach against corruption (Jain 2001; Martinez-Vazquez and McNab 2003; Rose-Ackerman 1997; Shleifer and Vishny 1993). The question is can fiscal decentralization reduce the opportunities for corruption in the public sector?

The extant literature mainly suggests that greater accountability of decentralized government and interjurisdictional competition can potentially deter the spread of corruption in government. The interjurisdictional competition argument has received little attention and there is much to be explored. The "voting with one's feet" argument by Tiebout (1956) is the basic principle of horizontal competition. The critiques may argue that citizens often lack the necessary mobility across jurisdictions for the gains from horizontal competition to emerge. The issue of vertical competition with regards to corruption is virtually untouched. Vertical competition is usually defined as a competition between the tiers of government. Usually, vertical competition is associated with competition between the federal government and state governments who have certain legislative authorities (Breton 1996). Most economic studies of corruption employ principle-agent model. Usually the principle is the central government and the agent is a bureaucrat who takes bribes from the private individuals interested in public goods and

services. Vertical competition is an important complement to horizontal competition, because it does not require physical movement of residents across jurisdictions. Since the central government is in a unique position as defined by the constitution, the only way to subject it to competition is through vertical competition (Breton 1996; Knutsen 1992).

In this thesis we will analyze the vertical competition that comes with decentralization and the implications for corruptibility of government officials. In general, vertical competition is associated with federal systems. But vertical competition can occur between the central government and subnational governments in a unitary state (Breton and Fraschini 2003). The nice aspect of vertical competition is that in a decentralized system, people are citizens of all tiers of government and do not have to have perfect mobility to make choices between the government tiers.

We contribute to the empirical literature on corruption, by analyzing the link between corruption and decentralization by using alternative measures of actual corruption for cross country analysis. Where appropriate, we use panel data analysis as well. Also we analyze the link between corruption and decentralization in the United States. We contribute to the literature by testing the relationship between corruption and different aspects of decentralization, such as revenue autonomy, and fiscal accountability. First, reliable fiscal data are available for the states in the United States. For example, availability of own source revenue data make it possible to measure revenue autonomy of local governments. Second, cross state analysis would allow us to hold fixed some political and cultural factors that are difficult to control in cross country analysis of corruption and decentralization.

The rest of the dissertation is organized as follows: Chapter 2 reviews the current literature on corruption, decentralization, and the relationship between the two. Chapter 3 discusses the theoretical model, and Chapter 4 describes the variables, discusses the econometric estimations and reports the results. The final chapter is the conclusion.

CHAPTER II. LITERATURE REVIEW

One can find evidence of corruption in both public and private sectors virtually in every country. However, comparative studies show that corruption is pervasive in less developed countries. For example, according to the Corruption Perception Index Transparency International (2004a), corruption is perceived to be rampant in lower income countries such as Indonesia, Kenya, Angola, Madagascar, Paraguay, Nigeria and Bangladesh. However, that does not suggest that corruption scandals are not unheard of in developed countries.

Abuse of public office power for personal gain or corruption of government is a very old problem, and you can find the stories of corrupt behavior even in ancient civilizations (Bardhan 1997). Until recently, corruption of government was often tolerated and treated as a norm. In countries like South Korea the economy performed extremely well, despite the corruption in government. Even one of the G7 member countries, Italy, ranks poorly in terms of corruption. In states which suppressed the free market, bribery could sometimes be seen as a way around the inefficient oppressive government machine. The "grease money" argument says that when government is inefficient and oppressing, the bribery could help firms to overcome that obstacle and increase efficiency (Leff 1964). Western companies tolerated corrupt practices in developing countries as a necessary part of the way of conducting business in those countries. It is possible that to the westerners the cost of resisting the corrupt activities often outweighed the benefits.

Since the mid 1990s such tolerance of corruption has effectively ended. Is it because there is more corruption or it is in someone's interest to reduce corruption? One

cannot definitely identify the reasons why. Lack of adequate data prevents us from answering that question clearly. A greater number of democratized countries, increased freedom of media, access to information, reliance on markets, efforts of non government organizations, the end of Cold War, globalization, and the efforts by the United States are all behind the increased interest in corruption (Tanzi 1998b).

Whatever the reasons, the attempts to quantify and address the issue internationally brought people around the world to express concerns about corruption in their governments. The Gallup International Millennium Survey reveals that roughly 90 percent of people in different countries characterize their governments as corrupt and bureaucratic as opposed to efficient, just and responsive to the will of people.[4] International watchdogs such as Transparency International report increasing trends in perceptions of corruption worldwide.

Multilateral lenders like the World Bank and the IMF, and the OECD, who had been constrained from assisting countries to fight corruption, started to emphasize anti-corruption efforts starting in mid 1990s. For example, the World Bank significantly stepped up its efforts under current President James Wolfensohn, following the landmark speech on corruption at the 1996 IMF/World Bank Annual Meeting. Since then, the Bank has launched over 600 anti-corruption programs in nearly 100 countries[5]. Yet the latest information from Transparency International report increased perception of corruption in many countries around the world. Why does corruption not go away?

[4] http://www.gallup-international.com/survey5.htm
[5] http://www.worldbank.org

The Reasons Why Corruption Persists

Issuing laws is not sufficient to control the country. The laws have to be carried out by the numerous bureaucrats, who are often inadequately paid by the government. Since the interests of the businessmen are not likely to always coincide with the provisions of the rules and regulations, the decisions made by bureaucrats are likely to conflict with what the businessmen want. Then businessmen will find it most efficient and practical to corrupt the officials to his way. In this environment corruption may persist (Lewis 1951).

Faced with this kind of problem, the government has three possible policies Morgan (1964): (1) "do nothing." Ignore the problem, hoping that the public would not notice the extent of the problem. In the pursuit of playing down the problem, the government may try to limit the freedom of press; (2) "hang scapegoats." Government can pretend that it is doing something about the corruption. One can find examples of high profile corruption prosecutions that are allegedly selective; (3) "moderate the rules." Rules are violated because they differ from what people want to do. Countries with free press and independent judiciary are constantly engaged in updating the rules in the direction of public notion of reasonableness. Morgan says open and democratic regimes tend to follow the third policy, while dictatorial regimes follow the first two policies. As long as there are rules, regulations, and laws there likely to be pressure to become corrupt.

It is rather hard to find a country with no laws and rules. Even the primitive societies establish certain rules and customs. Then what makes some of the countries more prone to corruption? First, the existence of economic rents, such as large military

spending and natural resource revenues can contribute to the problem of corruption if the government system is non-transparent (Gupta et al. 2000; Leite and Weidmann 1999). In many of the less developed countries, foreign aid does not reach the target because the officials in charge of distributing and handling the aid money have incentive to steal. Foreign aid does not reduce corruption; in fact aid often goes to more corrupt countries. Aid dependence erodes the quality of governance (Alesina and Weder 2002; Knack 2001). Both of these studies establish a negative robust relationship between various measures of corruption and foreign aid. Moreover, Alesina and Weder (2002) find that while Scandinavian and Australian aid goes to countries with lower corruption, the U.S. favors democracies. That suggests that unless the anti-corruption efforts are on priority list of donors, foreign aid might contribute to corruption in recipient governments.

Many of the countries cannot afford to pay well their civil servants. For example, in transition economies it is not unusual when salaries are not paid for months and the civil service salaries are barely enough for adequate living. Underpaid civil servants are more prone to become corrupt (van Rijckeghem and Weder 2001). Van Rijckeghem and Weder find that countries with higher civil service salaries relative to those in manufacturing sector tend to have lower levels of bureaucratic corruption. That supports the argument that civil servants with low wages often have supplement their income with bribes or other legal and illegal sources income to sustain an adequate living for themselves (Morgan 1964).

Countries cannot pay adequate civil service wages mostly because of economic constraints. Then economic instability or transition could generate fertile ground for corruption. For example, countries in transition such as Russia find itself in increasing

corruption after the fall of the Soviet Union and subsequent economic crises. Braun and Di Tella (2004) argue that inflation variability can lead to higher corruption and lower investment. They find that one standard deviation increase in inflation variance from the median increases corruption by 12 percent of a standard deviation and reduces economic growth by 0.33 percentage points. Along the similar lines, the market structure seems to be important. Conventional wisdom is that competition may be a way to reduce the returns from corruption. But there are recent arguments that an increase in competition may not lower corruption, rather corruption affects the number of firms in free-entry equilibrium (Bliss and Di Tella 1997). In other words, corrupt officials extract money from firms and lower the returns from investment, which forces some firms to exit. Celentani and Ganuza (2002) analyze the relationship between competition and corruption in procurement markets, and show that cost of tougher competition may be higher corruption. In other words, faced with limited supply of government contracts the firms are under pressure to do everything possible to get ahead of the line, including bribery. But things change a bit when economy is open. More open economies are likely to make efforts to improve the governance and have lower corruption (Wei 2000a). Wei estimates the "natural openness" by regressing export and import share of GDP on the population size, and demographic and geographic characteristics. Using his estimated "natural openness" measure, he finds that "naturally open" economies tend to exhibit less corruption. Moreover, "naturally open" countries tend to pay higher civil servant wages relative to those in private sector.

However, even when wages are low some people preserve their integrity under all circumstances and behave in a manner consistent with civil service standards. That

implies that there are some factors, other than monetary, that influence peoples' decision to engage in corrupt activities. There is a literature on social norms and how they tend to play a large role shaping individual's attitude towards corruption; individual opposes less to corruption if others are corrupt (Gatti et al. 2003; Mauro 2004). Fight against corruption may start with educating the children and teaching them the values of clean society. In his 2004 address to the nation, the president of India Abdul Kalam[6] said "…there are only three members of the society, who can remove corruption… They are father, mother and elementary school teacher." The implication is that the morals of people have to be changed for corruption to go away. Hauk and Saez-Marti (2002) show that the economy has two steady states with different levels of corruption in a framework of an overlapping generation model with transmission of values. They assume that agents can either be corrupt or honest and newborn agents form their preferences according to parents' effort to educate them and the general corruption level in the society. Principles can leave the high corruption state by promising a better future for the children. For their children's sake parents exert higher education effort thus increasing the proportion of moral agents. According to them, educating the young ones is the most effective tool in fighting corruption. Then lack of morals could be one of the reasons for persistence of corruption, but certainly cannot be the only one. Even the honest individuals can be consumed by the corrupting system over time as the cost of being corrupt outweighs the cost of being honest.

There are number of studies that stress the significance of political system and institutional design. Empirical evidence by Lederman et al. (2004) suggests that political institutions are important in determining the prevalence of corruption. Countries with

[6] http://www.indiagov.org/president/rd_jan25_04.html

stable, democratic, or parliamentary governments and the countries with free press are likely to have lower corruption. Openness, legal traditions are not significant determinants of corruption once controlled for political institutions. Charap and Harm (1999) argue that corruption patterns are endogenous to political system. Competitive corruption patterns are associated with anarchy and weak dictators, while strong dictators implement a system of monopolistic corruption. Dictatorships should be more centralized than democracies (Alesina and Spolaore 1997; Alesina and Weder 2002). Ades and Glaeser (1995) find that countries with history of dictatorial regimes have capital cities that are much larger, relative to the size of the nation, than in democratic countries. Poor infrastructure that increases the cost of internal trade, and high tariffs that lower the degree of openness contribute to concentration of population in urban areas. More importantly, concentration of power in central government at capital city leads to growth of large capital city. That leads to concentration of wealth which attracts migrants to the capital city. Persson et al. (2001) find that larger voting districts – and thus lower barriers to entry - are associated with corruption, whereas larger shares of candidates elected from party lists – and thus less individual accountability – are associated with more corruption. Altogether, proportional elections are associated with more corruption, since voting over party lists is the dominant effect, while the district magnitude effect is less robust. Besides macroeconomic, institutional and cultural determinants of corruption, there are some identified microeconomic factors as well. Clarke and Xu (2004) find that profitable, newer enterprises and the ones with higher overdue utility payments are likely to pay bribes. On the other hand, countries with state-owned or less competitive utility sector tend to have higher bribe levels. For example, Finland and Laos have about the same

number of people. Finland has a telephone density of 55 mainlines per 100 people, while Laos has a density of less than one mainline per 100 people. It is clear that there is a shortage in telephone lines in Laos. It would be not surprising if people offered bribes to get ahead of the line for telephone installation, if you take into account the fact that the waiting list for telephone line is zero in Finland, while it is almost six thousand people in Laos.

There are some findings that suggest countries with more representation of women in parliament tend to have lower levels of corruption, and corruption is less severe where women comprise a larger share of labor force (Dollar et al. 2001; Swamy et al. 2001). These two studies provide some evidence that increasing women's representation might reduce corruption in an organization and its environment. It can, of course, be the case that less corrupt and more democratic countries employ more women and provide more opportunities to women. But the relationship between gender and corruption is an interesting issue that hasn't been explored well. It is possible that women are indeed less prone to corruption as shown by Schultze and Frank (2000). In an experimental setting, they find that women behave no differently than men in the non-risk treatment, but that they are significantly less corruptible in risky (real world) situations indicating a higher degree of risk aversion.

In his recent study, Mauro (2004) shows relationship between political instability, economic growth, and corruption. Intuitively his model argues that if an official is corrupt and collects bribes from firms, then corruption reduces entrepreneurs' incentives to invest which in turn slows down economic growth. Citizens may penalize corrupt government for slow economic growth by not reelecting. The problem is that citizens

may not know who exactly is corrupt, thus decide not to reelect the whole government. This shortens the career of uncorrupt official, thus making him more inclined to extract all the rents he can while in office. In other words, when corruption is widespread, individuals do not have incentives to fight corruption even if everybody is better off without it. Cabelkova and Hanousek (2004) find that when people perceive that corruption widespread, they are likely to be more willing to offer bribes. Similarly, corrupt politicians can produce more corrupt politicians. Casellia and Morelli (2004) argue that individuals with lower competence seek public office and countries may find themselves in short supply of more competent individuals in government because so do other competent individuals. As a result less competent incumbents may take larger share of public offices and by corrupting the system may make it incentive incompatible for more competent individuals to seek public office.

How to Fight Corruption

There have been a variety of suggestions on how to fight corruption. The most common ones suggest some combinations of "sticks" and "carrots." Some suggest that public servant wages be raised, hoping that well paid civil servants would resists the temptation of bribes. However, van Rijckeghem and Weder (2001) have shown that wages have to be increased significantly before they have any effect on corruption. In other words, although corruption may potentially be mitigated by raising civil servant wages, the costs may outweigh the benefits. Increasing public sector wages places heavy burden on budgets (Besley and McLaren 1993). Most of the countries with high corruption are the ones who are struggling with budget deficits. For example, budget deficits for

Madagascar and Paraguay were 2.7 and 3.3 percent of their respective GDPs in 1999 (World Bank 2004). Yet the central government in Paraguay was spending 43.1 percent of their expenditures on wages that same year.

Others suggest that bonuses be offered to those who uncover corrupt activities (Chand and Moene 1999; Polinsky and Shavell 2001). Chand and Moene (1999) suggest that fiscal corruption may be mitigated through provision of incentives such as bonuses to fiscal officers based on how much taxes they collect. One of the finding of the analysis is that the distributional effects of tax evasion and corruption are unambiguously regressive under the kinds of schemes usual in practice. Collecting taxes without inducing evasion or corruption may require that tax inspectors be paid commission on high income reports. However, offering bonuses may not always be effective in fight against corruption. For example, Polinsky and Shavell (2001) analyze corruption in law enforcement in the form of bribes to officers, threats to frame innocent individuals in order to extort money from them, and the actual framing. They argue that the state may combat corruption by paying rewards to enforcement agents for reporting violations. Though reducing bribery, it may encourage framing. Thus rewards should be balanced so that it reduces both bribes and framing. Overall, the success of these methods are conditional on higher level of governments being corruption free or governments not framing innocent individuals in pursuit of bonuses.

The theoretical model by Choi and Thum (2004) suggests that ex post incentive of corrupt officials' to increase the bribe demanded induces delay in entry decisions of entrepreneurs. The intuition is that government starts to ask for increased bribes after firms start investing substantial amounts of money on physical capital, which makes exit

very unattractive solution. They suggest that job rotation might reduce officials' ability to price discriminate thus could help mitigate corruption. If officials are frequently reassigned to different regions or sectors, the likelihood of officials asking for increased bribes would decrease because they'll be faced with new entrepreneurs each time.

Brunetti and Weder (2003) provide empirical evidence that higher freedom of press leads to lower corruption in a cross country study, and causation runs from more press freedom to less corruption. Press freedom is measured by the index from Freedom House, which has compiled indices of press freedom based on expert opinions, findings of international human rights groups and press organizations, analysis of publications and news services and reports of governments on related subjects. Corruption is measured by corruption index from International Country Risk Guide. Instrumental variable and panel data analysis show that press freedom is an important check on corruption. Economically the relationship is significant too. If Indonesia were to free their press to the level of Norway, then the corruption would be reduced to the level of Singapore.

Despite numerous suggestions for fighting corruption, no one seems to have found a definite method to combat corruption. Jain (2001) stresses the importance of economic rents associated with investments and the strengths of political institutions in combating corruption. The question raised in this dissertation is whether a change in government structure to a more decentralized form can reduce the opportunities for corruption or change the incentive structure of the corrupt officials.

Fiscal Decentralization

In recent years more and more countries are pursuing decentralization policies. The World Bank reports that some 95 percent of democracies have elected subnational governments, and more and more countries are devolving political, fiscal, and administrative powers to subnational governments (World Bank 2000). Political reality often compel the governments to adopt decentralization strategy (Bird 1993). Governments in many developing and transition countries hope that decentralization will give answers to their fiscal and political problems as well as improving the service delivery etc.

But what is decentralization? It is hard to give a straightforward definition. Decentralization literature provides distinctions among deconcentration, delegation, and devolution (Litvack et al. 1998; Rondinelli 1981). Deconcentration is dispersion of certain central government responsibilities to regional offices of the central government. This is not real decentralization because there is no transfer of authority from the central government to subnational governments. Next, delegation is a process where the central government transfers responsibility fro decision-making and administration of functions to subnational governments. But subnational governments are held accountable to the central government. Although the subnational governments have some discretion, they still have to act according to the central government wishes. Lastly, devolution happens when central government transfers authority for decision-making and finance to subnational governments. Under devolution, local governments elect their leaders and

raise their own revenue to finance the expenditure needs they identify. We are interested in devolution in our analysis.

Depending on what functions are devolved, the decentralization can be called fiscal, administrative, and political. If authority to raise revenues and spend are devolved we would observed a fiscal decentralization. In this thesis we are mainly interested in analyzing the effect of fiscal decentralization on bribery.

Some countries are more decentralized than others. There is a wide range of reasons why it is so. Legal traditions, constitutional system, and economic background are all important factors in decentralization. First, decentralization is strongly influenced by a legal tradition. For example, common law system is not based on hierarchy of norms.[7] This may partly explain why English unitary state could integrate much more decentralization than the French one. English local authorities are not merely local agents of the central power like in original French system, but have competence to discharge their own functions in their own right (La Porta et al. 2003).

Second, if central governments are given the most important central powers it is likely to pursue centralization. By definition, the central governments in unitary states are given the centralized power. Then, the unitary systems are likely to have central governments unwilling to give up their power. On the other hand, if there is legislature composed of the representatives of local authorities, then the opposite is true.

Third, countries push more responsibility towards their subnational units as their income rises. Even the unitary and traditionally centralized government find themselves

[7] Common law is the body of customary law, based upon judicial decisions and embodied in reports of decided cases, which has been administered by the common-law courts of England since the Middle Ages. From this has evolved the type of legal system now found also in the United States and in most of the member states of the Commonwealth of Nations (Encyclopedia Britannica)

in a need to delegate and devolve many of the government functions. In many cases the government may create new responsibilities as the nature of the economy changes. Many of those tasks may be more suitable to be handled by the local governments. Bahl and Linn (1992) argue that as countries advance economically the gains from fiscal decentralization emerge.

Advantages of Fiscal Decentralization

Decentralization by itself does not provide solutions to problems. For decentralization to occur local authorities must have a decision-making competence. In other words, decentralization can work only when substantial tasks and powers are transferred with staff and financial means to match (Bahl 1999a). Also, decentralization is a complex process that should be implemented in a right way to have any benefits (Bahl 1999b).

What are the advantages of decentralization if the process is carried out properly? The advocates of decentralization argue that decentralizing the delivery of local public goods without substantial interjurisdictional spillovers improves the efficiency and responsiveness of the public sector in at least four ways--by promoting allocative efficiency (Breton 1996; Hayek 1945; Musgrave 1959; Oates 1968; Qian and Weingast 1997; Tiebout 1956), by fostering productive efficiency (Ostrom et al. 1993), by facilitating cost recovery (Briscoe and Garn 1995; Litvack and Seddon 1999), and by securing national unity (Litvack et al. 1998).

The first argument, promotion of allocative efficiency, is the most common one. It is said to promote allocative efficiency by allowing greater differentiation of resource

allocations across jurisdictions according to the demand in each locality. Subnational governments are argued to be in a better position than the central government to insure that services delivered match the preferences and circumstances in the jurisdiction. There are two main reasons why it is the case. First, subnational governments are closer to people than the central government, thus they are considered to have better information than the central government about the preferences of the local populations (Hayek 1945; Musgrave 1959). Second, subnational governments are thought to be more responsive than central governments to variations in demand for public goods. In this view, decentralization increases the likelihood that governments respond to the demands of local population by promoting competition among subnational governments (Tiebout 1956). Competition allows for a variety of bundles of local public goods to be produced, and individuals reveal their preferences by "voting with their feet." This interjurisdictional competition is seen to pressure subnational governments to pay attention to the preferences of their constituents and tailor the service delivery accordingly whilst risking the loss of tax revenue (Oates 1968; Qian and Weingast 1997). But, vertical competition between the national subnational governments might make intergovernmental competition beneficial (Breton 1996).

Next, a political rationale for decentralization is that good governments are those closer to the people (World Bank 1997). Ostrom et al. (1993) argue that citizens tend to be more aware of subnational governments' actions than they are of actions of the central government. The mobility of labor can impose discipline on subnational governments, and more effective incentive schemes can be designed if local officials are responsible for local outcomes. Similarly, Gordon and Wilson (2001) argue that competition for

residents forces officials to reduce the waste of public resources and increase the public expenditure. If financing of public services is devolved via the assignment of tax instruments or the collection of user fees, incentives for effective governance arise according to the logic of "market preserving federalism." Clear institutional arrangements, budget constraints, and revenue expectations drive local government to maximize cost-efficiency and constituent service (Qian and Weingast 1997).

Third, making services more demand-responsive through decentralization is thought to have the added benefit of increasing households' willingness to pay for services (Briscoe and Garn 1995; Litvack and Seddon 1999). Households are more willing to pay for the services that meet their demands. People are likely to be willing to pay taxes knowing that their local tax money would go into building a neighborhood park. If local governments have greater control over how revenues are used they may exert greater fiscal effort to raise tax revenues. Also, the tighter the circuit of public service finance and delivery, given a more transparent system, the more obvious the systematic corruption becomes to subnational governments and communities. This strengthens the incentives of subnational governments and their constituents to monitor revenue collection, planning, expenditure, and service delivery. This in turn helps increase willingness to pay both taxes and fees.

Lastly, a quite different political rationale for decentralization is to accommodate pressure for regional autonomy, and increase legitimacy and sustainability of heterogeneous national states (Litvack et al. 1998). Especially large countries such as the Russian Federation, China and Canada with one or more regions with different ethnic groups find themselves in a need to give some level of autonomy to regions to avoid

separatist movements. In smaller countries such as South Africa, Uganda, Sri Lanka, Ethiopia, Bosnia and Herzegovina, and Colombia decentralization has served as a path to national unity. After the abolishment of apartheid, the racial jurisdictions were formally abolished and the country was subdivided into racially mixed provinces and municipalities with democratically elected governments. Instead of falling apart into separate white and black countries, South Africa kept its national unity thanks to decentralization policies. In Uganda, giving power to the people of villages to choose their leaders helped to subdue the hostilities between fractions after the civil war (World Bank 2000). Despite the challenges the decentralization policies help to preserve the national unity in countries with diverse ethnic, religious, or racial groups.

Corruption and Decentralization

Decentralization has a significant impact on the economy and the society as evidenced by its relationship with variety of issues.[8] Recently there is an increasing interest in the possible relationship between corruption and decentralization. Besley and Coate (1999) have shown that in a world of benevolent governments, the disadvantages of centralization stressed in the literature, except the informational advantages regarding the preferences of local voters and citizens, disappear, suggesting that the case for decentralization must be mostly driven by political economy considerations. Lockwood (2002) argues that the cost of centralization is not policy uniformity, but inefficient

[8] Various studies have tried to link decentralization to economic growth (Davoodi and Zou 1999; Woller and Philips 1998; Xie et al. 1999; Zhang and Zou 1998), social capital (de Mello 2004), quality of public services (Khaleghian 2004), macroeconomic management (Ter-Minassian 1997), accountability (Khemani 2001), government size (Ehdaie 1994; Stein 1999), and regional disparities (Canaleta et al. 2004; Habibi et al. 2001; West and Wong 1995)

choice of projects due to cost-sharing and lack of responsiveness of the legislative process to benefits. Decentralization might be justified by increased accountability and responsiveness of government. Increased accountability and transparency are the keys to a successful economic approach against corruption (Jain 2001; Martinez-Vazquez and McNab 2003; Rose-Ackerman 1997; Shleifer and Vishny 1993). These seem to be the attributes of successful decentralization. The question is whether decentralization is associated with less corruption.

A wide variety of models have been developed in an attempt to answer the question of whether decentralization is likely to reduce the potential for corruption or increase opportunities for it. The models provide mixed theoretical support, and the empirical evidence on the relationship between corruption and decentralization is also mixed. The differences in theoretical predictions can be partly explained by the fact that the corruption and decentralization are defined differently in many of the models, and assumptions, regarding the mobility of residents, preferences of the officials etc., vary greatly. Therefore, it is not surprising that the predictions and implications of the theoretical models differ widely. For example, some models assume the central government to be honest, while others do not. Let us review the existing literature on the relationship between corruption and decentralization.

Under decentralization local governments are held directly accountable for their actions, while under a centralized system the government cares only about aggregate performance, i.e., inflation, economic growth etc. (Tabellini 2000). Besides, citizens are likely to be more vigilant and governments are more accountable at the local level. Based on data on India, Khemani (2001) finds the evidence that supports this argument. She

finds that in state assembly elections, voters reward incumbents for local income growth, and punish them for growth in inequality, over the entire term in office. However, in national elections voters behave shortsightedly by rewarding growth in national income and a fall in inflation and inequality only in the year just before elections. Based on analysis of the decentralization of power as a problem in the allocation of control rights under incomplete contracts, Seabright (1996) argues that decentralization may be valuable in improving accountability of governments to their citizens even without differences in preferences between localities. Despite the benefits of policy coordination, centralization has the cost of diminished accountability, "which can be precisely defined as the reduced probability that the welfare of a given region can determine the re-election of the government."

Decentralization can create incentives for regional governments to foster economic growth (Jin et al. 2000). They credit the market-preserving federalism for the economic growth in China. They argue that given the proper incentive the local governments in China acted in a way that supported the economic activities in their localities during 1979-1993. By shifting power to local governments, the Chinese were able to avoid the interventions by the central government that would have compromised the reforms. Wei (2000b) argues that country-wide anti-corruption reforms are less effective because there are number of disadvantages such as political risk, budgetary constraint, and local suitability of the reforms. He argues that if the reforms fail to produce results soon enough the high level politicians face risk of being voted out the office. Raising wages of the civil servants create pressure on budgets that are already constrained in the presence of corruption. Lastly, one size does not fit all. Differences in

local traditions, history, and institutions make it difficult to design a single anti-corruption reform. Wei (2000b) proposes to start reforms from a single locality and go upwards. That way the above mentioned risks are reduced. For example, reform in one locality is going to be much less costly than national reform, and failure in one place is not likely to affect the outcome of the elections thus reducing the political risks for the politicians. In other words, decentralized anti-corruption reform is likely to be more effective and easier to start.

How about the relationship between petty corruption and decentralization? Bureaucrats often have monopoly in providing certain services to the public. Normally, citizens are not mobile. Voting with one's feet is not an option most of the time. This creates a temptation for bureaucrats to ask for bribes from the public for the services they provide. Bureaucratic competition is sometimes proposed as a way to reduce that kind of corruption. In case of limited mobility, official discretion might be reduced if clients are allowed to obtain services from any of several independent bureaucrats responsible for the provision of the same services (Sanyal 2004; Shleifer and Vishny 1993). For example, residents in the United States can choose which Department of Motor Vehicles (DMV) office to go to obtain their driver's licenses. That reduces the monopolistic power of the bureaucrats issuing licenses. If a clerk at DMV office asks for a bribe, citizens are less likely to comply, since they can always choose to go the next office a few miles away.

Carbonara (1999) studies the effect of decentralization on corruption in a hierarchical organization, where decentralization is defined as the delegation of control power to lower levels. Under a decentralized system, the agents at lower levels have more

discretion and are freer to engage in corruption, without having to worry too much about being overruled by superiors. However, this does not mean that decentralization leads to more corruption. With decentralization superiors might have a higher incentive to monitor. If the superior layers in charge of detecting and punishing corruption are corrupt themselves, decentralization actually increases corruption. If the manager benefits more from uncovering more bribery cases, then decentralization can improve her incentives to monitor corrupt agents, thus increasing the probability that the agents are caught and it is possible that decentralization helps in controlling corruption.

In some countries, especially the large ones, the central government may have challenges in its attempt to control the budgets of subnational governments. In some cases, it may make sense to decentralize (Litwack 2002). Litwack argues that in the presence of corruption and informal autonomy, central government's efforts to control subnational budgets might be counterproductive and lead to higher overall tax burden and, consequently, lower output. He argues that subnational governments set aside some part of the formal budget in an informal budget for their private use. Subsequently, the subnational public expenditures are suboptimally low. When the central government mandates certain expenditures without additional funding, the subnational government raises taxes instead of reducing their informal budgets. This creates distortions in the system in the form of higher taxes and leads to lower output. He argues that unless the central government starts a major reform and imposes high costs on subnational governments for corrupt activities, the attempts to control the subnational budgets are likely to do more harm than good. Yet the central government has to be careful in decentralizing the authorities. Unless the central government is strong, devolution of

power may result in local governments competing with each other by shielding firms from central tax collectors or regulators (Cai and Treisman 2004).

Greater cohesiveness of interest groups and higher levels of voter ignorance at the local level would make capture at the local level more likely if you ignore the other factors that contribute to local capture (Bardhan and Mookherjee 2000). The other factors are the relative extent of electoral competition, electoral uncertainty, and heterogeneity among local districts with respect to intra-district inequality. For example, lack of electoral competition would result from a loyalty bias to one particular party, and the existence of a large number of swing voters contributes to electoral uncertainty. Thus, the extent of local capture may be context and case specific. Bardhan and Mookherjee (2001) provide an analytical framework to evaluate the resulting trade-offs and to predict the effects of decentralization on the volume and allocation of service delivery under different financing mechanisms. They find that greater fiscal autonomy of local governments expands the volume of service delivery, but this tends to be accompanied by service overprovision to local elites at the expense of the non-elites.

The economically optimal amount of corruption might not be zero (Waller et al. 2002). Using a hierarchical model of government, they study whether centralizing corruption within the higher level of government increases or decreases the total amount of corruption. They define corruption two ways: bribe per investment project and total bribe payments in the economy. Depending on the definition the predictions of the model differ. Adding a layer of government increases the total amount of corruption. They argue that if corruption is measured by the amount of bribes per investment project, then centralizing corruption at the top of the government may lead to a more efficient

allocation of corruption. By more efficient, they mean less bribe per investment that leads to more investment in the formal sector.

However, the above model assumes a single autocrat, for example a governor in a corrupt region, or a corrupt municipality. We ask the question in a bit different way. What happens if there is more than one autocrat? Horizontal competition between governments to attract residents is not strong if mobility of residents is limited (Brueckner 2000). If that is the case, we argue that competition between central and subnational government is particularly important. Also, because of its constitutionally defined unique nature, the central government is not subject to competition. The only way to subject the central government is through vertical competition. By decentralizing the government functions, thus creating strong subnational governments, it is possible to create vertical competition that could act as constraint on actions of corrupt government officials.

The empirical literature has not tested all the above theoretical hypotheses, mostly due to lack of adequate data, and the existing ones offer mixed results. Fisman and Gatti (2002a) find that fiscal decentralization in government expenditure is strongly and significantly associated with lower corruption across the sample of 55 countries controlling for the degree of civil liberty, country size (GDP and population), share of government expenditure in GDP, openness, ethnic fractionalization, index of contract enforceability, and dummy variable for countries with federal constitution. Their measure of corruption is the corruption index by International Country Risk Guide. This index is based on assessment of political risk faced by foreign private investors due to corruption of government in host countries. It is probably the most commonly used measure of

corruption in empirical studies. They measure decentralization by subnational share of total government spending averaged over the period 1980-1995. The data are from the International Monetary Fund's Government Finance Statistics. Robustness check is done using other corruption indices such World Competitiveness Report and German Export Index.

Gurgur and Shah (2005) find that decentralization has a negative impact on corruption, where decentralization is measured as a ratio of employment in non-central government administration to general civilian government employment, and corruption is measured by the corruption perception index from Transparency International. They divide countries into two groups, unitary and federal. They divide the sample of 30 countries into two groups and do weighted least squares estimation. Based on the coefficients of decentralization in each group, they conclude that decentralization in unitary states has a greater impact on corruption. The control variables are government size, complexity of tax system, openness, competitiveness of market structure, laxity of bureaucratic control, judicial fairness, democratic institutions, colonial past, lack of service orientation in bureaucratic culture, ethnic heterogeneity, government pay, and social development.

Treisman (2000) on the other hand finds that federal countries have higher perceived corruption. He uses a simple dummy variable for federal countries. A country is defined federal if it has a subnational government with constitutional defined autonomy. A federal country dummy variable might not reflect the degree of decentralization. Decentralization and federalism are not exactly the same things. According to Rubin (2001), "federalism is a principle of political organization in which a

single polity, or nation, has both a central government and separate, geographically defined governments that are subordinate to the central government in certain matters but independent of it in others." In contrast, decentralization is "a decision by the central government authorizing its subordinates, whether geographically or functionally defined, to exercise authority in certain areas. It differs from federalism in that the subunits that have been authorized to act do not possess any claim against the central government."

There is an evidence that the 1994 decentralization in Bolivia led to positive changes in public investment patterns in human capital and social services as poorest regions chose projects according to their greatest needs (Faguet 2004). The study measures the decentralization by dummy variable that takes the value of zero before 1994 and one after 1994. The test was conducted to analyze how the public investment has changed with decentralization and if need indicators were the determinants of that change. The results of the study contradict the claim that local governments are incompetent, corrupt and prone to capture by interest groups. The implication of this result is that local governments do better job of sensing the local needs compared with the central government.

Based on the existing empirical literature one can observe that specific aspects of decentralization have not been tested against corruption. Decentralization is a multifaceted concept that needs a careful analysis. In addition to the subnational share of government spending and the subnational share of government employment, the subnational share of revenues, autonomy enjoyed by the subnational, fiscal accountability of local governments, and number of local jurisdictions are all important aspects of decentralization. Cross country analysis is often hampered by a lack of comparative data.

There is hope for relatively reliable dataset for selected OECD member countries (Ebel and Yilmaz 2002). However, as of today the dataset is limited in its coverage. Once the coverage is extended the dataset could provide addition insights into the revenue autonomy aspects of decentralization process and its implications for corruption.

Almost all the studies employ the corruption perception index as their measure of corruption. The secretive nature of the corruption process and the incentive incompatibility of the parties engaged in corruption to reveal their actions hamper the measurement of true extent of corruption. One alternative is to use the data on actual prosecution of corruption cases and corruption victimization survey data. Data on prosecution is not flawless as we will discuss later. Victimization survey data are more reliable and draw a truer picture of actual corruption. The use of alternative measures of actual corruption for cross country analysis would be a contribution to the empirical literature.

CHAPTER III. THE THEORETICAL MODEL

A wide variety of models have been developed in an attempt to address the issue of corruption. An interesting way to approach the problem is to model the government as a maximizer of bribe revenues. Waller et al. (2002) argue that socially optimal level of corruption is not zero and that centralized bribe collection is less harmful than decentralized bribe taking. They assume that there are three players in the economy: entrepreneurs, who are required to obtain business licenses from numerous bureaucrats; bureaucrats, who charge bribes for issuing the licenses; and the autocrat, who gets the share of bribe revenue. According to their hierarchal model of government, centralized corruption lets the autocrat coordinate the bribe collection thus leading to lower bribe per investment project. On the other hand, decentralized corruption makes the autocrat just another bribe collector in addition to uncoordinated local bureaucrats setting their own bribes, thus leading to higher bribes in aggregate. This is also consistent with Shleifer and Vishny (1993), who argue that cost of corruption is higher when different government agencies and bureaucrats impose independent bribes on private agents seeking complementary permits from these agencies.

This model is suitable to describe corruption in a single, small jurisdiction, for example a city where the autocrat is the corrupt mayor and the bureaucrats are the various inspectors who are collecting bribes for him. Indeed if the city government cannot control its corrupt bureaucrats the total corruption is likely to be high as the model predicts. However, this model does not take into account the possibility of competition between two or more autocrats. Various forms of competition between autocrats are possible. For example, vertical competition between central and local governments, and horizontal

competition between corrupt officials in neighboring cities, counties, or regions etc. Separation of powers and federalism create rivalries between different players in the government. That creates incentives to prosecute corruption. Moreover, if internal monitoring works well, corruption is unlikely to appear in first place (Glaeser and Goldin 2004).

In our research we will examine bribery and the effect of decentralization on corruption when there is a competition between the central and subnational governments. There are two fundamental reasons for emphasizing vertical competition (Knutsen 1992). First, vertical competition is the only way to subject the central government to competition, because of the constitutionally defined unique nature of the central government. Second, vertical competition is particularly important when there is limited physical mobility of the citizens. The merits of horizontal competition only materialize if capital or labor is mobile. That is why vertical competition is a very important complement to horizontal competition.

We believe our research contributes to the literature by identifying a channel through which decentralization might influence corruption, namely a vertical competition between the levels of government given a clear division of expenditure responsibilities. We develop a theoretical model of a bribe revenue maximizing corrupt government, and examine how the change in government system, i.e., from centralized to decentralized one, changes the bribes they collect.

Greater decentralization leads to interjurisdictional competition between local governments to attract residents (Brennan and Buchanan 1980; Tiebout 1956). The literature provides a vast number of studies on tax competition. Traditionally, the tax

competition literature has emphasized the wasteful competition among governments for scarce capital through reduction in tax rates and public expenditures levels. More recently, the efficiency enhancing roles of competition have started to draw attention of the researchers (Wilson 1999). Vertical tax competition is a relatively less studied concept (Keen 1998). Vertical competition between corrupt officials is virtually an untouched subject. It is also very important subject because there is a need to challenge the monopolistic status of the central government officials. When asked what were the factors that contribute to an increase in corruption, people thought that the immunity of high level officials was one of the top three reasons. The other two were public tolerance of corruption, and deterioration of the rule of law (Transparency International 2002).

For the theoretical part we adopt a framework developed by (Choi and Thum 2002, 2004). They analyze how the option of entrepreneur to flee into the underground economy affects the corruption in the government. We change the settings of the model and introduce two levels of government and make the following assumptions:

1. There are two levels of government. There is a clear division of responsibilities. Officials at each level make decisions regarding the economic activities. We ignore the numerous bureaucrats who work for the official, assuming that the official has a full control over them.

2. There is a population of entrepreneurs whose total number is normalized to unity. Entrepreneurs are heterogeneous in their ability to generate income. Let v denote an entrepreneur's net earnings reflecting his ability. In other words, the earnings are net of costs and taxes. The distribution of abilities is given by the inverse cumulative

distribution function $F(v)$ with continuous density $F'(v) \leq 0$ that is $F(v)$ denotes the proportion of entrepreneurs who can generate income more than v.

3. Entrepreneurs are required to make an under-the-table payment in the amount of b to a corrupt government official in order to influence the decision of government in government procurement. Let us call b bribes. Various interpretations of b are possible, such as b is a kickback for awarding a government contract, or b is a bribe for getting a business registered, or b is a bribe for connecting to the public utilities. For example, when electricity has to be rationed with rolling blackout, some businesses may bribe public utilities to supply electricity without interruption. When there is a shortage of telephone lines, businesses often have to bribe officials in charge of distributing telephone lines.

The official sets the level of b to maximize his personal revenues. As the entrepreneur's earnings v is private information, the corrupt official cannot price discriminate and charges a uniform bribe b. From the entrepreneur's point of view, this payment b is an additional cost of conducting a business.

Corruption with Centralization

As a benchmark, we first consider a complete centralization of government. We assume that all the functions of the government are centralized, and the entrepreneurs are required to deal with the central government. Local government exists but under complete centralization it does not have any spending authority and acts as an agent of the central government. Let us assume that the central government collects bribe b from entrepreneurs for doing business in the official sector. By operating in the official sector,

firm must interact with government. Taxation, public infrastructure or government regulations all force private and government sector to interact. But, our model is mainly focused on the interaction between the two on expenditure side of the budget. Faced with a corrupt official, an entrepreneur can only choose to enter the market or not. To enter the market he has to pay *b* to the government official. Only the entrepreneurs who can generate non-negative incomes enter the market and make payment *b* to the corrupt official: $v - b \geq 0$. Given that officials ask firms to pay bribes *b,* the marginal type who is indifferent between entry and exit is given by $v = b$.

The corrupt official maximizes his revenue:

$$\max_b [w + bF(b)]$$

where *b* is the bribe collected from each entrepreneur, and *F(b)* is the number of the entrepreneurs in the economy. *bF(b)* is the total fees collected by the government official. In addition to the bribe revenue the official receives fixed wages *w*.

The marginal entrant b^* that maximizes the corrupt official's revenue is implicitly given by the first order condition:

$$F(b^*)+b^*F'(b^*)=0 \qquad (1)$$

Following Choi and Thum (2004), we make the standard assumption that the distribution of types satisfies the monotone hazard rate condition, that is, $-F(b)'/F(b)$ is increasing, $\frac{\partial}{\partial v}\left[-\frac{F'(b)}{F(b)}\right] > 0$

$$-F(b)''F(b)+[F(b)']^2>0 \qquad (2)$$

This assumption ensures that the second order condition for the maximization problem is satisfied:

$$2F'(b)+bF''(b)<0 \quad (3)$$

Using the first order condition, $b = -\frac{F(b)}{F'(b)}$, the second order condition is rewritten as

$$2F'(b) - \frac{F(b)}{F'(b)}F''(b) < 0 \quad (4)$$

From (2) we can derive $F'(b) > \frac{F(b)}{F'(b)}F''(b)$ and substitute into (4). Thus we can show that (4) is less than zero. Then the number of entrants is given by $F(b^*)$. The official asks a uniform bribe b^* from everyone (Choi and Thum 2002, 2004).

Corruption with Decentralization

Now we assume that the government is decentralized, so that entrepreneurs can do business in either central or local jurisdiction and the central government cannot directly control the actions of the local government officials. In other words, some of the spending authority is transferred to local governments, who make their own decisions. Let us assume that local government does not ask for bribes and the entrepreneurs can choose to operate in local jurisdiction to avoid paying bribe. However, local projects are likely to be less attractive than the ones administered by the central government. Local government expenditures are likely to be in primary and secondary education, basic health care, public libraries etc. Expenditures on these areas are likely to be smaller than the central government spending on military or major construction of highways. We can account for the decrease in value of the project by the coefficient *p.* In other words, by choosing to enter in business in local jurisdiction, a firm with have an earning capacity

pv. Other interpretations are possible. The central government may intervene in local government affairs and impose additional costs on entrepreneur, or the local jurisdiction does not have attractive business opportunities etc. The profit of a risk-neutral entrepreneur in local jurisdiction is then given by *(1-p)v*. Later on we will relax the assumption of corruption-free local government. For now we assume that only the central government asks firms to pay bribe.

As long as there is some profit can be made firms will enter the economy and operate in the jurisdiction of the local government,

$$0 \le v^*$$

where $v^*=b^*$ is defined by (1).

When entrepreneurs make their entry decisions, they choose the level of government that yields the highest expected profit. For a given bribe *b* asked by the government, the entrepreneur faces the following entry configuration: (1) if $\frac{b}{p} \le v$, then deal with the central government, in other words, entrepreneur will deal with the central government as long as whatever he pays in bribes is less than the expected earnings; (2) deal with the local government if $0 \le v < \frac{b}{p}$; (3) if $0 \ge v$, then there is no entry.

The corrupt official in central government takes into account that potential entrants may evade his bribery demands by dealing with local governments in local jurisdictions. Therefore, the corrupt central official maximizes

$$\text{Max } R(b)=bF(b/p)$$

The first order condition

$$F(b/p)+b/pF'(b/p)=0 \quad (5)$$

This determines the marginal type of entrepreneur b^{**} dealing with the central government. Entrepreneurs with low abilities $0 \le v^{*}$ stay out of business, and those with intermediate abilities $0 \le v < v^{**}$ operate in local jurisdiction, while high ability entrepreneurs ($v^{**} \le v$) deal with the central government make contributions to the corrupt central government official.

Proposition: In an economy with corruption, the revenue maximizing bribe payment *b* is lower and the total number of entrepreneurs is higher in equilibrium if government spending authority is decentralized versus completely centralized.

Proof. Evaluate (5) at b^{*}, which is the marginal bribe rate under centralized corruption: From (1) $F(b^{*})+b^{*}F'(b^{*})=0$. Then for $F(b^{*}/p)+b^{*}/pF'(b^{*}/p)=0$ to be equal to (1), the following must be true $b^{**}/p=b^{*}$. Since $0<p<1$, $b^{**}<b^{*}$.

Lower bribe *b* leads to lower *v,* which means lower ability entrepreneurs can enter the economy, thus increasing the total number of entrepreneurs in the economy. In other words, direct benefit of decentralization is such that the corrupt official is forced to lower the bribe rate, which leads to more entry into the economy. The intuition behind the lowered bribe argument is that the government officials is interested in how much total bribe revenues he/she can extract from the businesses. If higher bribe rates encourage entrepreneurs flee into underground economy or into other jurisdictions, then the officials will be willing to reduce the bribes they ask in order to maximize their total bribe revenues. According to our model, a reduction in bribe rate does increase the number of entrepreneurs doing business with the government and willing pay bribes.

Corruption in Local Government

It is not realistic to assume that local government officials will not demand bribes from entrepreneurs. How does the result change when we relax that assumption?

The corrupt central government official charges b for allowing each entrepreneur to operate in his jurisdiction, while one in local jurisdiction demands b_1. For an entrepreneur of type v, the profit from entering the central government jurisdiction has not changed ($P_1=v-b$), but the profit in local jurisdiction has changed since there is now bribe demand b_1 from the local government: $P_2=v-pv+b_1$. For the entrepreneur in local jurisdiction, there is a probability p of not earning v. In other words, we assume that by choosing to deal with local government projects, firms face lower quality of infrastructure, less public goods, etc. We make an assumption that central government bribes are always greater than local government bribes, $b>b_1$. This assumption is for computational convenience only, and does not alter the main conclusion of the model.

For given bribery demands b and b_1, the entrepreneurs have the following entry strategies: (1) deal with the central government if $\frac{b+b_1}{p} \le v$. Entrepreneur will choose to enter into deal with the central government if bribes he has to pay to central government official is less than the sum of bribe to local government and the expected earnings from conducting a business in local jurisdiction, $b< v(1-p) - b_1$;

(2) deal with the local government if $\frac{b_1}{1-p} \le v < \frac{b+b_1}{p}$; (3) if $\frac{b_1}{1-p} > v$, then do not enter.

Compared with the entry configuration in the previous section, bribery demands by local governments do not fundamentally change our results.

If we redo the central government official's maximization problem:

Max $R(b)=bF((b-b_1)/p)$

The first order condition:

$$F((b^{***}-b_1)/p)+b^{***}/pF'((b^{***}-b_1)/p=0 \quad (6)$$

Since the official's demand schedule b is uniquely determined by v, we can it more convenient to treat v as the control variable[9] in a central government's bribe maximization problem under complete centralization:

Max $R(v)=w+(v-t)F(v)$

The marginal entrant v^* that maximizes the corrupt official's revenue is implicitly given by the first order condition:

$$F(v^*)+(v^*-t)F'(v^*)=0 \quad (7)$$

Under decentralization with zero local bribery $v=b/p$, then

Max $R(v)=pvF(v)$

The first order condition

$$F(v)+vF'(v)=0 \quad (8)$$

Under decentralization with non-zero local bribery, the maximization problem takes the following form. Since $v=(b-b_1)/p$

Max $R(v)=(pv+b_1)F(v)$

The first order condition:

$$F(v^{***})+vF'(v^{***})+b_1/pF'(v^{***})=0 \quad (9)$$

If we evaluate (9) at v^{**}, which is the marginal type of entrepreneur in decentralized system with no local corruption: From (8) $F(v^{**})+v^{**}F'(v^{**})=0$ and $F(v^{**})+vF'(v^{**})=$ -

[9] Choi and Thum, 2002

$b_1/pF'(v^{**})>0$ and we have $\partial R(v^{**})/\partial v \succ 0$. Thus, $v^{***}>v^{**}$ or $b^{***}>b^{**}$. Bribes by the central government are higher under decentralization with local bribery compared to the setting under decentralization with no local bribery. However, if we evaluate (9) at v^*, which is the marginal type of entrepreneur in centralized system: From (7) $F(v^*)+v^*F'(v^*)-tF'(v^*)=0$ and the sign of $b_1/pF'(v)+tF'(v^*)= [b_1/p+t]F'(v^*)<0$ and we have $\partial R(v^*)/\partial v \prec 0$. Therefore, $v^{***}<v^*$ or $b^{***}<b^*$. In other words, bribes by the central government are lower under decentralization.

The theoretical model suggests that bribe rate and number of firms in the economy are influenced by the structure of the government, namely whether its spending authority is decentralized or centralized. For example, if government official receives bribes in form of kickbacks from corrupting government procurement decisions, our model predicts that when central government is solely responsible for procurement decisions, the central government official will ask firms to pay him high bribes. Centralization may influence the number of firms in the economy through the bribe rates. If the bribe required to secure government contracts is very high, then only large or firms with high earnings are likely to afford to stay in business. The bribe rate is influenced by decentralization as vertical competition for clients serves as a constraint on government behavior. Central government is subjected to competition if some of the government functions are devolved to lower levels of governments. Firms can choose to do business with local governments instead of central governments. Even though local governments are likely to be corrupt, the bribe required to secure government contracts are lower thus leading to more entry of smaller companies or companies with lower earning capability. From the model, we develop the following testable hypotheses:

The hypothesis is that all else being equal, a change from centralized to decentralized government structure leads to a decreased bribe rate. The implication is that if government is decentralized, then competition is likely to occur between the levels of government to attract the bribe base, assuming the bribe base is not common. For the base to be not common there needs to be a clear division of expenditure responsibilities. Bribe rate has to go down if the government at any level of government wants to keep businesses in its jurisdiction. In other words, under fiscal decentralization it's in governments' interest to lower the corruption. Thus corruption is likely to go down with greater fiscal decentralization.

In summary, we will use this testable hypothesis to examine the effect of decentralization on corruption. We empirically investigate the impact of decentralization in the following chapter. First, we discuss the data and estimation methodology and finally present the results.

CHAPTER IV. DATA AND ECONOMETRIC ESTIMATIONS

The hypothesis is that decentralization decreases the level of bribes and/or corruption can be tested empirically. First, we describe the available data sources in detail for cross country analysis. In the latter part of the chapter we will discuss the variables used in cross state analysis.

Measures of Corruption

There are four main types of measures available for cross country and panel data analysis. The first one is based on police reports on actual investigations, prosecution, and conviction of corrupt officials. In many countries the governments keep track of statistics on prosecution of public corruption. If we take corruption prosecution per capita, then we can get corruption data comparable across countries based on hard evidence. The second type of data is based on crime victimization surveys. These are based on surveys of victims of various crimes, including those who were asked by the government to pay bribes. Adjusted for population, this type of data may be a better alternative to prosecution data because bribery cases often go unreported. On the other hand, people are more likely to answer questions on their experience with bribery in responding to a unanimous survey. The third type of measure is based on surveys of individual experts and experts with multinational corporations. For example, *International Country Risk Guide* from PRS Group, Inc.[10] assesses political, economical and financial risks associated with investing in various countries. Risk attributed to the corruption in government is one of the components of the political risk in that survey.

[10] http://www.prsgroup.com/icrg/icrg.html

There are other similar surveys that rank countries based on corruption, such as the one from Economic Intelligence Unit. Lastly, there are survey of surveys such as the Corruption Perception Index from the Transparency International, and governance indicators from the World Bank. These indices are based on surveys such as *International Country Risk Guide.*

Data on Prosecution and Conviction of Corruption Cases

Actual prosecution and conviction data on bribery for cross section of countries are available from the *United Nations Survey on Crime Trends and the Operations of Criminal Justice Systems.*[11] The United Nations' survey asks the governments of participating countries a series of questions on the main components of the criminal justice system. The first two surveys covered the period 1970-1980. The latest (eighth wave to cover the period 2001-2002) survey instrument was sent to 191 Ministers of Foreign Affairs (UN) in August 2003. It is too early to expect the responses to that survey. Seventh wave of survey for the period 1998-2000 was sent out to the governmental institutes of 203 countries in 2001 and as of May 2004, ninety two countries have responded to the survey. For our study we take the data from the 4th, 5th, 6th, and 7th wave of surveys covering the period 1986-2000.

There are potential problems with regards to the reliability of the data. Only some crimes are reported by victims to the police, who may only record a portion of reported incidents in the official data. Cross country comparison of the data may be complicated

[11] http://www.unodc.org/unodc/en/crime_cicp_surveys.html accessed on May 30, 2004.

due to differences in defining specific crime types in different countries, levels of reporting and traditions of policing, and social, economic and political contexts.

The survey asks the governments to report the number of police reports, investigations, prosecution, convictions, and punishments for crimes such as murder, rape, robbery, property theft etc. Among them, bribery and/or corruption is included as separate crime classification. In the survey *"Bribery and/or corruption"* may be understood to mean requesting and/or accepting material or personal benefits, or the promise thereof, in connection with the performance of a public function for an action that may or may not be a violation of law and/or promising as well as giving material or personal benefits to a public officer in exchange for a requested favor.

Rule of law is likely to determine the prosecution effort. If the criminal justice system is corrupt itself, there is less likelihood of corrupt officials being successfully prosecuted and convicted. When there is weak rule of law and little trust in the courts and police, people are less likely to report the crime to the police, thus reducing the reliability of the data.

Corruption Victimization Surveys

Relatively more reliable data come from crime victimization surveys that are conducted by International Crime Victim Surveys (ICVS), a joint project by UNICRI and UNODC.[12]

Two types of methodologies have been used by the ICVS to standardize the data. The first one is CATI methodology for the countries with high telephone penetration, and

[12] United Nations Interregional Crime and Justice Research Institute and United Nations Office on Drugs and Crime.

the second one is Face-to-Face methodology for the countries with low telephone penetration, in most cases the latter are restricted to the capital city. For CATI surveys, a sample of between 1000 and 2000 households was drawn by random dialing of telephone numbers. Face-to-Face methodology was adopted in all developing countries and the countries in central and East Europe. Samples of 1000 respondents were generally drawn from the population of the largest city, although in a few countries the surveys covered either several cities.

The survey has run since 1989. Subsequent surveys were conducted in 1992, 1996 and 2000, and the master file consists of 135,465 cases from 92 surveys in 56 countries. The results of the surveys show that almost nobody was affected by requests for paying bribes in Western European urban areas (0.2% of population was asked to pay bribes on average). However, bribery is a serious problem in Central-Eastern European cities (17 percent on average). Requests for bribes by police officers were most frequent, followed by medical staff, customs officers. Overall, the victimization surveys are more reliable because there is less underreporting that is present in official corruption prosecution data. People usually underreport crimes because of lack of confidence in the police and the judicial system (del Frate and van Kesteren 2004).

Political Risk due to Corruption

International Country Risk Guide (ICRG) is probably the most widely used corruption index, partly because of its wide cross country and time series coverage (Keefer and Knack 1995). Annual data are available starting from 1984 to present, covering over 100 countries. ICRG's corruption index is based on an assessment of

corruption within the political system. They are mainly concerned with the extent of threat to foreign investment. They assess "the actual or potential corruption in the form of excessive patronage, nepotism, job reservations, 'favor-for-favors', secret party funding, and suspiciously close ties between politics and business," because these forms of corruption pose a great "risk to foreign business in that they can lead to popular discontent, unrealistic and inefficient controls on the state economy, and encourage the development of the black market."

"The greatest risk in such corruption is that at some time it will become so overweening, or some major scandal will be suddenly revealed, as to provoke a popular backlash, resulting in a fall or overthrow of the government, a major reorganizing or restructuring of the country's political institutions, or, at worst, a breakdown in law and order, rendering the country ungovernable."[13]

This corruption index may be biased because tolerance towards corruption varies across countries. If corruption is more acceptable in one country, then there is less political risk as a result of corruption. For example, in some of the Asian countries, corruption is not as politically disruptive as corruption in Latin America.

Data on Perception of Corruption

Arguably, more reliable measures available today are corruption perception indices mentioned earlier. Some may argue that perception indices could potentially be inaccurate. But these indices are usually based on survey of individuals and/or

[13] http://www.prsgroup.com

organizations that have had first hand experience with the corruption in those countries. There is some empirical evidence that finds a positive and significant association between the corruption perceptions and the willingness to bribe (Cabelkova and Hanousek 2004). The nuance is that perception of corruption tends to lead people to believe bribing is necessary or acceptable. Similar results are obtained from a study on Uruguay (Rossi et al. 2004). Based on survey data for Ukraine Cabelkova and Hanousek find that when citizens perceive that the government is corrupt, they are likely to offer bribes and the government officials are likely to accept. This creates a cycle of increased corruption. Once more and more people start to accept corruption, it becomes much harder to control the problem. Eventually, corruption becomes a norm and people have to adjust their behavior to the new reality.

In 1995, Transparency International, a non-governmental body, began using various opinion surveys to compile an annual *Corruption Perception Index* (CPI) (Transparency International 2004a). The *CPI* provides data on perceptions of corruption within countries. It is a composite index that consists of credible sources using different sampling frames and various methodologies. CPI includes only countries that have some indicators of corruption from at least three sources, such as *Business Environment and Enterprise Performance Survey (BEEPS)* and *Opacity Index* from *PriceWaterHouseCoopers*, which increase their validity. All the sources generally define corruption as a misuse of public power for private benefits, for example bribing of public officials, kickbacks in public procurement, or embezzlement of public funds. Each of the sources assesses the extent of corruption among public officials and politicians in the country. For example, *BEEPS* asks firms if it is common for firms of their line of

business to have to pay some irregular additional payments to get things done. Opacity Index is based on answers to questions on the frequency of corruption in various contexts such as obtaining export permits, avoiding taxes etc.

There can be several potential biases in perceptions of corruption depending on who you ask. If you ask the locals about the corruption in their countries, their response might be biased because the value and standards of ethics likely to differ across countries. If you ask only expatriates to rate the corruption in a particular country their answers might be biased as well because they might lack proper understanding of different cultures. Some of the data sources used in *CPI* are based on local surveys, while others are based on survey of expatriates. But there are high correlations between the different sources used in the *CPI*, which indicates an overall reliability, and the combination of all the sources reduces the potential biases.

For this study, year to year comparability of corruption perception index is of great interest. According to the Transparency International, comparisons to the results from previous years should be based on a country's score, not its rank. Because a country's rank can change simply because new countries enter the index and others drop out. A higher score is an indicator that respondents provided better ratings, while a lower score suggests that respondents revised their perception downwards. Better rating means an absence of corruption. However, year-to-year shifts in a country's score can result not only from a changing perception of a country's performance but also from a changing sample and methodology. With differing respondents and slightly differing methodologies, a change in a country's score may also relate to the fact that different viewpoints have been collected and different questions been asked.

As compared with the *CPI* 2001, in 2002 Bangladesh's score has improved by 0.8 points. However, this change was due solely to methodological changes: the new standardization technique avoids negative numbers. For example, last year the worst individual score provided to Bangladesh was -1.7. This year the worst standardized score is 0.3 due to the methodological changes. Bangladesh's original values had remained largely constant. As a consequence, the higher score in 2002 in no way reflects actual improvements. Therefore, we will not use the CPI for panel analysis. But, CPI is still very useful for cross country analysis.

Similar index but with wider sample size is constructed by Kaufmann et al (2003). They present estimates of six dimensions of governance covering 199 countries and territories for four time periods: 1996, 1998, 2000, and 2002. The six dimensions are:

(1) Voice and Accountability; (2) Political Stability and Absence of Violence; (3) Government Effectiveness; (4) Regulatory Quality; (5) Rule of Law; (6) Control of Corruption. These indicators are based on several hundred individual variables measuring perceptions of governance, drawn from 25 separate data sources constructed by 18 different organizations. This indicator is highly correlated with Corruption Perception Index (above 0.9). Kaufmann et al. (2003) corruption index covers 195 countries, which is almost twice as many as in CPI. Year to year comparability of this indicator is also questionable. Thus it is preferable to use the data for cross country analysis only.

Both CPI and Kaufmann et al. (2003) indices are based on surveys such as World *Business Environment Survey (WBES),* which is by itself a very appealing data source for our research. This survey provides useful information specifically with regards to specific aspect of corruption such as frequency of bribery, bribe as share of firms' revenues etc.

WBES was administered to enterprises in 80 countries in late 1999 and early 2000, utilizing a standard questionnaire methodology. This comprehensive survey of over 10,000 firms reports enterprise responses to multiple questions on the investment climate and business environment as shaped by domestic economic policy, governance etc. This survey analysis is available only for one year, which makes it useful only for cross-sectional analysis.

Subsequent studies of *WBES* are *Investment Climate Surveys* of the World Bank *Group and the Business Environment and Enterprise Performance Surveys* of the European Bank for Reconstruction and Development and the World Bank. The data reports on the investment climate and economic decisions of more than 14,000 firms in over 30 countries. The survey asks questions such as “How much do small, medium and large firms pay unofficially to "get things done?,” “Which investment climate obstacles most affect employment and investment?,” and “How much of your revenue do you give in bribes?” For our empirical test, the responses to the last question are of great interest to us. Our hypothesis is that decentralization leads to lower bribe payments per firm.

Simple correlation matrix in Table A shows that there are high correlations between some of the indices. Our main variable of interest Bribe/Revenue rate (*Bribe as share of firms' revenues*) is correlated with victimization rate, and two perception indices. There is no correlation with conviction rate. Conviction rate is not significantly correlated with other measures of corruption. High correlations between Bribe/Revenue rate, Victimization Rate, and Corruption Perception Indices attest to the reliability of these data sets.

Table A. Correlation Matrix of Various Corruption Indices

	Bribe /Revenue Rate	Conviction Rate	Victimization Rate	Corruption Risk (ICRG)	Perception Index (WB)
Conviction Rate	0.08				
Victimization Rate	0.31*	-0.06			
Corruption Risk (ICRG)	0.09	0.25*	0.67***		
Perception Index (WB)	0.40***	0.18	0.73***	0.77***	
Perception Index (TI)	0.38**	0.19	0.73***	0.86***	0.92***

For source and the descriptive statistics see Table 1.
*** p<0.01, ** p<0.05, * p<0.1.

It is worth noting that there are several recent studies that attempt to measure corruption at micro level (Reinikka and Svensson 2004; Golden and Picci 2004). Reinikka and Svensson propose survey techniques to collect a quantitative micro level data on corruption using public expenditure tracking survey, service provider survey, and enterprise surveys. Golden and Picci, on the other hand, construct a corruption index for Italy's provinces and regions based on the difference between the monies spent on infrastructure and the existing physical infrastructure. The larger the difference the larger money is presumed to be siphoned off to mismanagement, fraud, kickbacks and embezzlement. However, this type of index would be extremely difficult to construct for large cross section of countries. Thus we do not use this index for our analysis.

Measure of Decentralization

Another problematic issue is the measurement of the degree of decentralization of government. Measuring decentralization is a rather difficult task (Ebel and Yilmaz 2002). Some try to measure by number of subnational jurisdictions, while others measure by subnational government employment. By far the most widely used measurement is a subnational share of total government expenditure (Oates 1972; Panizza 1999). International Monetary Fund's *Government Finance Statistics Yearbook (GFS)* has served as source of data mainly because it provides data that are consistent across countries.

Our theoretical model predicts that decentralization of government expenditure responsibilities lead to lower optimal bribes. Subnational share of total government expenditures is an appropriate measure of expenditure decentralization in the context of our model. Thus, in this study, decentralization is measured as a subnational share of total government spending, based on *GFS*. Subnational expenditure is a sum of local and provincial/state government total expenditures net of transfers to other levels of government. For countries which do not report provincial level data, subnational data are the data for the local government and vice versa. Total expenditure is a sum of consolidated central government and subnational government expenditures. However, to eliminate double counting, we have to exclude transfers from central government to subnational government. Expenditure includes both current and capital expenditures. It does not include government lending or repayments to the government or government acquisition of equity for public purposes.

As of 1996, forty six out of 149 countries report both the national and subnational level data in *GFS*. In particular, thirty two countries report central and local level data, two countries report central and provincial level data, and twelve countries central, provincial and local level data[14]. This is not sufficient for careful analysis of decentralization. We complemented this dataset with data from a variety of sources. For example, subnational share of total government expenditures for Botswana, Brazil, Denmark, Dominican Republic, Guatemala, Ireland, Israel, Kenya, Nicaragua, Paraguay and Russian Federation in 1997 are reported by the (World Bank 2000).

Other Explanatory Variables

The theoretical literature suggests that corruption is mainly a function of economic rents, probability of being caught, ethnic and cultural characteristics, discretionary power of officials, strength of political institutions, and moral and social values play some role. But a lack of adequate data sources impedes the empirical analysis. However, we may be able to proxy for economic rents, probability of being caught, ethnic and cultural characteristics.

Economic Rents

Ades and Di Tella (1999) provide a support for the proposition that economic rents would foster corruption. Besides, Goel and Nelson (1998) use size of the public sector as proxy for the value of economic rents. However, the public sector has many

[14] http://www1.worldbank.org/publicsector/decentralization/webfiscal.pdf

elements some of which do not provide high rents, such as health care or education. Thus, the size of the public sector may not be a good proxy. Some of the least corrupt countries such as Sweden have large public sectors and very high taxes. It is possible that governments that are able to raise high revenues are more likely to pay adequate salaries, and effectively monitor its officers. There is an argument that when governments cannot raise adequate tax revenues they are likely to rely on indirect revenues such as bribery (Henderson and Kuncoro 2004). Instead, the involvement of government in the economy is better measured by extent of its regulations and rules. Heavy government involvement in economic activities and extensive use of rules and regulations rather than fiscal instruments are likely to lead to corruption. But it is hard to quantify discretionary power of government. Economic freedom index from Heritage Foundation is a good proxy. They define economic freedom as "the absence of government coercion or constraint on the production, distribution, or consumption of goods and services beyond the extent necessary for citizens to protect and maintain liberty itself."

To measure economic freedom, the authors use 50 independent economic variables that fall into ten broad categories: trade policy, fiscal burden of government, government intervention in the economy, monetary policy, capital flows and foreign investment, banking and finance, wages and prices, property rights, regulation, and black market activities. The index weighs each factor as equally important to evaluate the economic freedom in any country. Thus the overall score is average of all ten factor scores. The scales run from 1 to 5: A score of 1 signifies an institutional or consistent set of policies that are most conducive to economic freedom, while a score of 5 signifies a

set of policies that are least conducive. For the latest year which is 2003, the economic freedom score is reported for 156 countries.[15]

Another alternative measure of economic rents is an evaluation of the extent of government's financially repressive policies. Financial repression takes many forms, and can be measured in many different ways. The 2001 Milken Institute Capital Access Index focuses on the direct government inferences in the provision of capital from savers to borrowers. The 2001 index is based on evaluation of the general macroeconomic environment, the ease of securing loans from the banks, equity and bond market development, which is often another way of obtaining finances, and the access to the international capital. However, the economic freedom index and capital access index a highly correlated and the estimations results are not significantly different, thus it will suffice to use one of them, and we chose economic freedom index.

Probability of Being Caught

Probability of detection, strength of political institutions, moral and social values, and severity of punishment all play role in how corruption is spread. First, an absence of civil liberties and political rights is a favorable environment for increased corruption (World Bank 2000). Rights to free and independent media and freedom of speech are likely to decrease the tolerance of the public to corruption (Moreno 2002). There is evidence that a long duration of democracy reduces the perception of corruption (Treisman 2000).

[15] www.heritage.org

There are several indices of civil liberty, political freedom and press freedom. Civil liberties include the freedom to develop opinions, institutions, and personal autonomy without interference from the state. Freedom House uses surveys based on standards drawn from the Universal Declaration of Human Rights. These standards apply to all countries and territories, irrespective of geographical location, ethnic or religious composition, and level of economic development, which makes it objective and, more importantly, comparable across countries. Besides the civil liberty index, the Freedom House builds a political rights index. Political rights enable people to participate freely in the political process. This includes the right to vote and compete for public office and to elect representatives who have a decisive vote on public policies. Both of the indices are assigned a numerical rating on a scale of 1 to 7, where 1 represents the most free and 7 the least free. The latest survey, which is for the year 2003, covers 192 countries and 18 territories. The third variable, Freedom of Press index, is constructed by examining the level of press freedom in each country in three broad categories: the legal environment, political influences, and economic pressures.

First, the legal environment encompasses an examination of the laws and regulations that could influence media content as well as the government's inclination to use these laws to restrict the ability of media to operate. Second, political control over the content of news media is evaluated by examining access to information and sources, editorial independence, official censorship and self-censorship, the ability of the media to operate freely and without harassment, and the intimidation of journalists by the state or other actors. Finally, economic pressures on the media are examined. These pressures include the structure of media ownership, the costs of establishing media outlets as well

as of production and distribution, the selective withholding of state advertising or subsidies, official bias in licensing, and the impact of corruption and bribery on content.

Each country is rated in these three categories, with the higher numbers indicating less freedom. A country's total score is based on the total of the three categories: a score of 0–30 places the country in the Free press group; 31–60 in the Partly Free; and 61–100 in the Not Free press group. Survey data come from correspondents overseas, staff travel, international visitors, the findings of human rights and press freedom organizations, specialists in geographic and geopolitical areas, the reports of governments and multilateral bodies, and a variety of domestic and international news media.

Ethnic Fractionalization

The decision of an official to engage in corrupt activities will depend on the likelihood of him receiving the bribes and kickbacks. In ethnically fractionalized societies, ethnic communities are likely to provide sanctions against those who do not keep their promises thus facilitating corruption (Fearon and Laitin 1996). This kind of corruption contract enforcement is likely to encourage corruption. In addition, public officials are likely to favor their relatives in societies where family ties are strong (Mauro 1996; Tanzi 1994). Also in ethnically fractionalized societies that corruption is likely to be more harmful because corruption is likely to be less organized (Shleifer and Vishny 1993).

There are a number of indices available that measure ethno-linguistic fractionalization. The most commonly used one is the index of ethno linguistic fractionalization, discussed in Mauro (1995) and originally calculated by Taylor and

Hudson (1972). This index is based on data from 1960 and constructed in the Soviet Union for the Atlas Narodov Mira. The ethno-linguistic fractionalization is measured by the probability of two randomly chosen individuals belonging to different ethnic groups.

$$EthnicFractionalization = 1 - \sum_i (\frac{n_i}{N})^2$$

where N is the total population and n_i is the number of people belonging to the i^{th} group. For our analysis we use ethnic fractionalization data constructed by (Alesina et al. 2003). This dataset provides ethnic fractionalization index for about 190 countries. The apparent advantage of this index is the coverage of the countries. The formula for calculation of ethnic fractionalization is the same as the one used in previous studies. The main source of data are (Central Intelligence Agency 2000; Encyclopedia Britannica 2000).

The Results of OLS Estimations

First model of interest is model 1 in Table 2. The dependent variable is defined as average bribes paid by the businesses, measured as percent of their revenues. The sample includes only developing and transition countries. Subnational share of government spending is associated with bribes as share of revenues negatively and statistically significantly at 10 percent confidence interval. The coefficients indicate that the elasticity of bribes with respect to subnational share of spending is 0.2; in other words, if decentralization is increased by one percent, then the bribes as share of revenues are likely to fall by 0.2 percent. This result is consistent with the predictions of our theoretical model that argues that decentralization of expenditures would force competing officials to bring the amount of bribe per entrepreneur down.

Equation 2 (Table 2) uses prosecution data to measure corruption. Intuitively, we would argue that decentralization leads to more competition between levels of government that result in more prosecution of corruption by each other. Especially, the central government is likely to step up its efforts to prosecute local corruption. Eventually, that prosecution effort would bring the total corruption down. Our estimates show exactly that. Convictions per 100,000 residents are negatively related with our decentralization variable and the relationship is statistically significant at 5 percent level. Convictions data are averaged over 1986-2002, because the data for shorter period of time may not accurately reflect the extent of the corruption problem. For example it takes a long to time to prosecute and convict on corruption charges. The coefficients shows that one percent increase in subnational share of total government expenditures would be associated with 0.55 percent decrease in prosecutions on corruption charges. However, we have to note that a conviction rate may not be an accurate indicator of corruption in a society.

The relationship between percent of people asked to pay bribes and decentralization is statistically significant at 10 percent level. The implication is that fiscal decentralization is associated with fewer bribe frequency. Our model predicted that bribe rates would be lower with decentralization. Our empirical analysis shows that both bribe rate and bribe frequency are lower with fiscal decentralization. A one percent increase in subnational share of spending leads to 0.44 percent decrease in number of people asked to pay bribes.

As specified, equations 1 through 3 (Table 2) explain up to two thirds of the variation of the independent variable. Sample size covers up to 57 developed and

developing countries. We have to consider an endogeneity of fiscal decentralization because the degree of fiscal decentralization could be endogenous to the government system. As we show later on, we find no evidence of endogeneity of fiscal decentralization.

Bribe rate, conviction rate, frequency of bribery are all measures of different aspect of bribery. Bribe rate measures the cost of bribery to businesses, conviction rate shows the extent of government crackdown on bribery, and frequency of bribery measures how much of the population is affected by the bribery. We find that all three measures are statistically significantly related with subnational share of government expenditures. That suggests that fiscal decentralization affects bribery not only in one aspect but in all aspects. This kind of robustness of the relationship attests the bribery reducing potential of fiscal decentralization.

All the control variables have expected signs as well. Economic freedom index is negatively and statistically significantly associated with corruption as one would expect. The relationship is statistically significant at 1 percent level when corruption is measured by victimization rate. In other cases, the statistical significance is not as strong, but not small either. The relationship confirms the claim that a greater economic freedom from the government regulations and interventions leads to lower corruption. The elasticity of the relationship is very high. One percent increase in economic freedom index leads to over three percent decrease in corruption victimization rate. Elasticity is a little lower for the conviction rate, but still greater than one.

Freedom of press is likely to be associated with lower corruption. When corruption is measured by crime statistics, the relationship is not strong. The estimated

coefficients are small that there is not need to discuss further. But, when corruption perception indices are used to estimate the relationship, the relationship between freedom of press and corruption indices is much stronger. We'll discuss those results later on.

The next variable of interest is ethnic fractionalization. Ethnically divided countries are likely to have more corruption because the relationships and favor mechanisms are likely to be easier to form. Ethnic fractionalization, measured as a probability of two randomly drawn individuals belonging to different ethnic groups, is positively associated with corruption perception indices and the relationship is statistically significant at one percent level in equations 3 (Table 2).

In equation 1 (Table 3), political risk due to corruption is a dependent variable. The relationship is negative and statistically significant at 10 percent level. That suggests that the risk faced by private entities due to corruption in government is reduced by fiscal decentralization. The last two equations use the corruption perception indices to test the relationship between corruption and decentralization. Subnational share of expenditures is negatively associated with both World Bank Governance Indicator and Transparency International's Corruption Perception Index and statistically significant at one percent level. When Transparency International's corruption perception index is used for estimation, the relationship is negative and significant at 5 percent level.

All other independent variables takes expected the signs and the relationships are statistically significant mostly at one percent level. Economic freedom and freedom of press indices are associated with lower corruption perception, while ethnic fractionalization index is positively related with corruption. As specified, the models explain up over three fourth of the variation in corruption indices.

Ordinal Nature of the Corruption Indices

However, we should not completely rely on OLS results because the corruption indices are ordinal in nature. Although the corruption indices are scores, they are based on survey results. Under corruption we understand the response to a survey question such as - "Based on your experience, how would you evaluate the corruption in this country?," on a scale from 0 to 6, where 0 means "wide spread corruption" and 6 means "no corruption at all." It is hard to say if a country with score of 2 is twice as corrupt as the country with score of 4. That's why we need to re-estimate the relationship between fiscal decentralization and corruption perception indices using ordered logit models. Since the scores in corruption perception indices are not integers, we need to round the numbers to the nearest integer.

The results of ordered logit models are given in Table 3. The equations 4-6 are estimated by ordered logit. The negative coefficient for subnational share of expenditures means that the likelihood of scoring high on corruption index did go down with higher fiscal decentralization. However, statistically the relationship is not very strong except when the Transparency International's Corruption perception index is used.

The use of probability models for ordered responses lends itself to the interpretation of parameters in terms of marginal probability effects. The question is: How does the probability of observing a certain outcome change if one of the independent variables changes? We are mainly interested in the effect of a change in fiscal decentralization on the probability of government being more or less corrupt. The estimated marginal probability effects are reported in Table 4. How does ceteris paribus

increase in subnational share of government expenditures affect the probability of country receiving a certain corruption score? The standard ordered logit model in Table 4 shows, for example, a value of -0.0037 for corruption perception index. That means that the probability of receiving a score of 7 on corruption perception index decreases by 0.0037 points if we increase subnational share of government expenditures by 1 percentage points. Seven is one of the higher scores on corruption index, in other words, the probability of being perceived more corrupt is lower when the subnational share of expenditures increases.

Endogeneity

There is a potential endogeneity problem with the estimation of the relationship between decentralization and corruption. Our model predicted that when central government decentralizes the system and devolves the finances, the bribery is likely to decrease. If corruption is widespread, then it would not be in the interests of the central government to devolve responsibilities to lower levels. By decentralizing the government the central government would likely be forced to lower the bribes it ask. The central government may resist the fiscal decentralization and attempt to centralize the expenditure decisions. If that is true, then it could create an endogeneity bias in our estimations.

We test for endogeneity of subnational share of expenditures by estimating the same equations with two stage least squares. The instrumental variables are GDP per capita, population, and geographical area. These are typical instruments used to estimate the degree of fiscal decentralization (Arzaghi and Henderson 2004; Oates 1972; Panizza

1999). The easiest way to check for presence of endogeneity is to compare the OLS and 2SLS estimates and determine whether the differences are statistically significant (Hausman 1978; Wooldridge 2002). The results of the estimations are virtually identical to the OLS results and Durbin-Wu-Hausman test fails to reject the null hypothesis thus there is no evidence of endogeneity.

Although Durbin-Wu-Hausman test fails to reject the null, there is a concern over the instrumental variables. In some cases the instruments do not explain much of the variation. The instruments chosen, GDP per capita, population, and geographic area, are almost standard instruments for fiscal decentralization and widely used as determinants of decentralization. There is a theoretical argument for using these variables as instruments, it is important to note that they may have not worked too well in some of the equations (See Table 2).

Panel Analysis

It is important to note that most of the research on corruption has been done with cross-sectional data. In addition to cross country analysis, we do an unbalanced panel data analysis. We have two potential corruption data useful for panel analysis: corruption conviction rate and the political risk due to corruption. We have missing years for at least some cross-sectional units in the sample, mainly in fiscal decentralization variable. Fiscal decentralization data covers the period 1972-2001, but many of the countries do not report data every year. Our longest time-series corruption data (political risk of corruption) are for the period 1984-2002. But the explanatory variables, index of

economic freedom and freedom of press indicators, are limited to 1995-2002. That shrinks our total time-series to the 1995-2002.

We will use only the index of political risk due to corruption for panel analysis because the year to year variation in corruption conviction rate data may not accurately reflect the increase and decrease in corruption over time. It is likely to take long time to prosecute and convict someone on corruption charges, thus conviction is less likely to take place in same year in which the corruption occurred. Prosecution effects are likely to vary depending on what party is in the office, how high is corruption prosecution on the priority list of the law enforcement agencies, etc. Therefore, the corruption conviction rate is not very accurate data for panel analysis.

A definite advantage of pooling time series and cross-sectional data is the increased degrees of freedom. However, a primary motivation for using panel data is to solve the omitted variables problem. Consider, for example, the hypothesized impact of decentralization on corruption. Examining the hypothesis with cross-sectional data could miss the potential influence of unobserved, country specific factors on corruption. We might erroneously reject or fail to reject the hypothesis of interest if decentralization was partially correlated with the unobserved, country specific factors. By utilizing panel data we can control for these unobservable effects, mitigating the potential problem of omitted variable bias (Baltagi 2001; Hsiao 1986; Wooldridge 2002).

In our analysis we will use the two-way random effects model for unbalanced panel data. Two-way analysis holds a strong intuitive appeal. We want to study the impact of decentralization on corruption over time on large number of countries. Limiting ourselves to one-way analysis could prevent the data from revealing the evolution of

these relationships across countries or through time and create omitted variables bias if the excluded effects were jointly significant.

Unbalanced Panel Data: Two-way Random Effects Model

Consider the regression model for two-way error components model (Baltagi 2001),

$$y_{it} = x_{it}\beta + u_{it}$$

$$u_{it} = \mu_i + \lambda_t + v_{it} \qquad i = 1,\ldots,N_t;\ t=1,\ldots,T_i$$

where x_{it} is a vector of regressors, and N_t is the number of countries observed in year t. The components of the error term, u_{it} are the unobservable country specific effect, μ_i; the unobservable time specific effect, λ_t; and the stochastic disturbance term, $v_{it.}$

The question is whether u_{it} should be treated as a random effect or fixed effect. In cases where the key independent variables do not vary much over time, fixed effects method can lead to imprecise estimates. The average standard deviation over the period 1996-2001 is 1.5 for decentralization index, 2.3 for economic freedom index, and 2.7 for press freedom index.

In random effects model, we assume that time and country specific effects are randomly distributed and that the parametric function varies from country to country. In contrast to fixed effects model, we assume that the unobservable country specific effects, $\mu_{i,}$ time specific effect, λ_t, and stochastic disturbance term, v_{it} are each identically, independently distributed with zero mean and constant variance. In addition, μ_i, λ_t, and v_{it} are independent of each other and x_{it} for all i and t. When these assumption hold, the

random effect model produces consistent and more efficient estimates than fixed effect model.

The key consideration in choosing between a random effects and fixed effects approach is whether μ_i and x_{it} are correlated. Hausman (1978) proposed a test based on the difference between the random effects and fixed effects estimates. Since fixed effect is consistent when μ_i and x_{it} are correlated, but random effect is inconsistent, a statistically significant difference is interpreted as evidence against the random effects assumption of orthogonality between μ_i and x_{it}.

H0: μ_i and x_{it} are uncorrelated. Random effects model consistent and efficient.

HA: μ_i and x_{it} are correlated. Fixed effects model is consistent but not efficient, GLS is not consistent.

Test statistic: $m = (b-\beta)'[m_b - m_\beta]^{-1}(b-\beta) \sim \chi^2_k$ under H0.

The results of panel data analysis are given in Table 5. Political risk due to corruption is negatively related with subnational share of total government spending and the relationship is statistically significant at five percent level. The Hausman test revealed that random effects estimation is preferred to fixed effects. The Hausman test H values are about 4. More precisely, we have a χ^2 statistics of 3.98 with 4 degrees of freedom, and the probability value of 0.41. Clearly, random effects model is preferred to fixed effects model. Other explanatory variables have the expected signs as well and the relationships are statistically significant at one percent level. Economic freedom and freedom of press are negatively associated with corruption. Ethnically fractionalized countries pose more political risk due to corruption.

Again, we should not forget that the corruption index is more ordinal variable than linear variable. Although the corruption indices are scores, they are based on survey results. We re-estimate the relationship between fiscal decentralization and corruption perception indices using ordered logit models.

The results of the ordered logit model estimations are given in Table 5. See the second column for the equations by ordered logit. The negative coefficient for subnational share of expenditures means that the likelihood of scoring high on corruption index did go down with higher fiscal decentralization. The relationship is statistically significant at 10 percent level. Other explanatory variables have the expected signs and the relationships are statistically strong as well. The magnitude of the ordered logit coefficient does not have a simple interpretation, but its sign and statistical significance agree with the linear regression results. But we are also interested in the effect of a change in fiscal decentralization on the probability of government being more or less corrupt. The estimated marginal probability effects are reported in Table 6. How does ceteris paribus increase in subnational share of government expenditures affect the probability of country receiving a certain corruption score? The standard ordered logit model in Table 6 shows, for example, the probability of country scoring 0 on a corruption index (which is no corruption) increases by 0.0010 percentage points if we increase subnational share of expenditures by one percentage points. Similarly, the probability of scoring 1 is increase by the increase in subnational share of expenditure. On the other hand, the probability of scoring a little higher on corruption index (which is being more corrupt) decreases with higher subnational share of expenditures.

Overall, the panel data estimation results confirm the results of the cross-sectional estimations. The higher subnational share of total government expenditures is consistently associated with lower corruption, whether corruption is measures by crime statistics or perception indices.

Corruption and Decentralization in the United States

Although we find that subnational share of government expenditures is negatively and significantly associated with corruption, we have to bear in mind that decentralization is a multi-faceted, broad concept. The literature provides distinctions among deconcentration, delegation, and devolution (Litvack et al. 1998; Rondinelli 1981). Deconcentration is dispersal of certain central government responsibilities to regional offices. This is not real decentralization because there is no transfer of authority from the central government to subnational governments. Next, delegation is a process where the central government transfers responsibilities for decision-making and administration of functions to subnational governments, but subnational governments are held accountable to the central government. Although the subnational governments have some discretion, they still have to act according to the central government's wishes. Lastly, devolution happens when central government transfers authority for decision-making and finance to subnational governments. Under devolution, local governments elect their leaders and raise their own revenue to finance the expenditure needs they identify. We are interested in devolution of authority to spend and raise revenues in our analysis because according to the literature, the advantages of decentralization are likely to materialize when subnationals have true autonomy and authority over fiscal resources

(Bahl 1999a, 1999b; Jain 2001; Martinez-Vazquez and McNab 2003; Rose-Ackerman 1997; Shleifer and Vishny 1993).

If both revenue and expenditure authority are decentralized, then citizens could "evaluate the relative performance of governments in terms of the tightness of wicksellian connections--both for horizontal and vertical competition" (Breton and Fraschini 2003). Breton and Fraschini define wicksellian connection as "a link between the quantity of a particular good or service supplied by centers of power and the taxprice that citizens pay for that good or service." Thus, decentralization of revenue authority might help to reduce corruption through increased accountability of governments. Subnational governments are likely to be held more accountable to their constituents because there is a better link between specific taxes and expenditure at lower level of government, and local citizens have greater control over local governments since they can vote them out if they suspect wrongdoings (Martinez-Vazquez et al. 2004).

We hypothesize that the greater revenue autonomy and revenue decentralization will lead to lower corruption. Due to lack of international comparable data on revenue autonomy, a meaningful cross country analysis is not possible at this moment. To test the hypothesis we use the data from the United States. Along with revenue decentralization measures, we use various measures of decentralization to analyze the link between corruption and decentralization. There is a newly available data on perception of corruption across states that provide cross-state comparison of corruption (Boylan and Long 2003).

Measures of Corruption in the United States

The United States, according to Transparency International, is one of the least corrupt countries. In 2003, The United States was 18th out of 133 countries ranked by the absence of corruption. Although the United States ranks very high on that list the problem of public corruption is not non-existent. According to the Department of Justice, there were 1,011 convictions on corruption charges in the United States in 2002. Forty two percent of the convictions were convictions of federal officials, while 39 percent of them were of state and local officials. Others were convictions of private citizens involved with public corruption.

Most of the studies on cross-state analysis of corruption for the United States are based on this corruption conviction data (Fisman and Gatti 2002b; Glaeser and Saks 2004; Goel and Nelson 1998; Meier and Holbrook 1992). However, prosecution and conviction data do not necessarily provide adequate measurement of corruption, because prosecutors have discretion over how much effort to put into corruption investigation. Also, federal prosecutions may be affected by state prosecutions. When a state has fewer resources to fight corruption, the federal government may step up the prosecution efforts. These corruption prosecution data do not include prosecution of corruption cases by the state governments. That further jeopardizes the reliability of the data. We are not able to find any significant relationship between prosecution of corruption and any of the decentralization indicators that we have used.

However, the number of corruption prosecutions shows that corruption in the public sector in the United States is not a thing of the past. But we have to note that the situation has significantly improved over the last century (Glaeser and Goldin 2004). By

constructing an index based on word counts from large number of newspapers from 1815 to 1975 and supplemented with other materials, they find that the United States was once considerably more corrupt than today, particularly during 1870s the corruption index was about five times higher than in 1970s. That suggests that the corruption has been decreasing in the United States, but it is not completely eliminated.

Corruption prosecution data also show that there are variations across states in the number of prosecutions per capita, and per public servants. But these data are not adequate measure of true extent of corruption for above mentioned reasons. Thus we cannot comfortably use the data to analyze the cross state variation of corruption. If data on prosecution of corruption cannot depict the true reality, then what is the best way to measure corruption? Recently, Boylan and Long (2003) constructed a dataset on perception of state house reporters' perceptions of public corruption in the United States. Although likely to be subjective, this type of perception data provides an alternative to federal corruption prosecution data.

Boylan and Long (2003) surveyed State House reporters to compare corruption across the states in the U.S. State House reporters are members of the press who cover state government. Arguably, the reporters are some of the best informed people on state affairs and are a relatively homogeneous group of people. That makes it easier to administer the survey across states, and the results of the survey are comparable across states.

They sent out survey questionnaires to 834 state house reporters in 1999. The overall response rate was 36.7 percent. Since there were no responses from three states, the final index includes 47 states. They rank states based on responses on one of the

questions in the survey, which asks reporters to rank their state on overall corruption. That question was chosen because of overall similarity of responses to that question by reporters within each state. The possible scores range from 1 to 7, seven being the most corrupt. North Dakota, South Dakota, and Colorado ranked the least corrupt, while New Mexico, Louisiana, and Rhode Island ranked the most corrupt out of 47 states. Massachusetts, New Hampshire, and New Jersey are not included in the index. Further, we exclude Hawaii and Alaska and leave 45 continental states' data in the sample.

Measure of Decentralization in the United States

We have six measures of decentralization each showing certain aspects of decentralization. The most commonly used measures of fiscal decentralization in cross country analyses are subnational shares of total government expenditures or revenues. These two indicators show the authority of local governments over expenditures and revenues. We use these to test the hypothesis that decentralization creates incentives for local governments to promote a favorable economic environment such as reduced corruption. The next two measures are autonomy (Akai and Sakata 2002) and accountability (Hovey and Hovey 2001). Autonomy, share of own source revenue in local total revenue, measures the fiscal independence of local governments from the state government, while accountability shows how much of their expenditures local governments cover from their own revenue sources. They will be used to test the hypothesis that decentralization, through increased accountability, can reduce the corruption. The last two indicators are employment decentralization and number of local

government per 10,000 citizens. The larger the number of local government the higher is the competition between jurisdictions.

1. Expenditure decentralization: We take local share of combined state and local government expenditures as an indicator of decentralization of expenditure authority. We use direct general expenditure to calculate the ratio. That means intergovernmental transfers are not included in this calculation. This variable captures the extent of local governments' authority over spending decisions.

2. Revenue decentralization: local government share of combined state and local government revenue is a measure of revenue authority enjoyed by the local governments. We use only the general revenue from own sources and exclude the transfers received from other levels of government because these intergovernmental transfers are either conditional or matching grants. Average local revenue authority is 40.7 percent, while average local expenditure authority is 53.8 percent (See Table 8). That suggests a gap in financing and expenditure by local governments. This gap is filled with transfers from higher levels of government. If most of the revenues come from other levels of government these two indicators may not show the true level of decentralization. That is why we need to measure the fiscal autonomy of local governments.

3. Fiscal autonomy: This indicator measures the fiscal independence by local governments. Even if local share of expenditure and revenues are low, the local governments may still be considered to be more decentralized if they raise most of their revenues from own sources. It is calculated as a share of total local government revenues that are from own sources. For example, local share of total state and local government revenues are 35 percent in Connecticut, which is one of the lowest in the United States

(See Table 8). But Connecticut ranks among one of the highest in terms of revenue autonomy. In other words, the local governments in Connecticut do not collect the most revenues but the revenues they do collect are mostly from their own sources.

4. Fiscal accountability: Fiscal accountability is measured by share of local government expenditures that are financed by own source revenues. The greater the share of local government expenditures are financed by revenues from own sources, the greater the accountability of local governments with regards to budget resources. In other words, local governments are held more accountable to the local residents who pay the taxes, rather than the higher level of government that transfers resources to local governments. Otherwise government spending can be excessive because the elected officials do not have to account to taxpayers for raising it. Michigan's example provides an interesting story. Although local governments in Michigan account for 61 percent of the state and local government expenditures, they only finance about 48 percent of their spending from own source revenues (See Table 8). That is what is called "accountability gap" (Hovey and Hovey 2001).

5. Employment decentralization: It is measured as a local share of full time total state and local government employees. The intuition behind the variables is pretty simple. When governments are more decentralized, the local governments are likely to hire more people because their revenue and expenditure responsibilities increase. That requires additional manpower. More people are likely to be employed by the local governments if the responsibilities of local governments increase. Stronger and more powerful local governments can provide competition to the state governments in terms of service delivery.

6. Number of local jurisdictions: Jurisdictional decentralization is measured as the number of local governments in each state per 10,000 people. This variable is of most interest for our analysis because it captures the effect of the competition between jurisdictions within a state. The argument is that as the number of competing jurisdictions grows, the horizontal competition between these jurisdictions induces local governments curb their corruption to attract businesses to their jurisdictions. Also this variable is suitable because of the uniformity of definition of local government across states in the United States. Local governments consist of counties, municipal governments, townships, school districts, and special districts for natural resources, fire protection, and housing and community development.

Table B. Simple Correlation Matrix of Decentralization Indicators

	Expenditure Decentral.	Revenue Decentral.	Fiscal Autonomy	Fiscal Accountability	Employment Decentral.
Revenue Decentralization	0.72				
Fiscal Autonomy	0.11	0.70			
Fiscal Accountability	0.06	0.66	0.97		
Employment Decentralization	0.82	0.72	0.25	0.22	
Number of Local Jurisdictions	-0.22	-0.09	-0.001	0.02	-0.24

Source: Constructed by the author from the US Census data.

Control Variables

Corruption depends on many factors. We include a number of control variables to avoid omitted variable bias. These control variables are analogous to many of the control

variables used in cross sectional analysis of corruption. First, we control for share of population in metropolitan areas. Because of congestion, proximity, and competition for scarce resources, the corruption is likely to be higher in densely populated urban areas (Alt and Lassen 2003). Also, there is evidence that trust networks and corruption are substitutes. In smaller cities, people are likely to form a bond of trust, whereas in larger cities individuals are likely to resort to bribery (Hunt 2004). Intuitively, large cities are likely to have more corruption because there is greater concentration of businesses, they are centers of political life, and bureaucracies decide about larger budgets. Therefore, we choose a metropolitan population as a share of total state population as a control variable.

Next, the fight against corruption may start with educating the children and teaching them the values of a clean society. Hauk and Saez-Marti (2002) show that the economy has two steady states with different levels of corruption in a framework of an overlapping generation model with transmission of values. They assume that agents can either be corrupt or honest and newborn agents form their preferences according to parents' effort to educate them and the general corruption level in the society. Principles can leave the high corruption state by promising a better future for the children. For their children's sake, parents exert higher education effort thus increasing the proportion of moral agents. According to them, educating the young ones is the most effective tool in fighting corruption. We use educational attainment of the state population as a proxy for education. It is measured by percent of population with high school or higher education.

Lastly, van Rijckeghem and Weder (2001) suggest that if government sector wages are low relative to other sectors, the government bureaucrats are likely to be more prone to corruption. If government employees are not adequately paid and their earnings

are not enough to cover their basic needs, they will have to supplement their income by accepting bribes. We control for this by creating a variable: Average government sector wage adjusted for the cost of living. The intuition behind the variables is that if average government pay is low, then the government employees are likely to be more willing to accept additional income from bribery. See Table 5 for summary statistics of variables.

The Results of the Cross State Estimations

The ordinary least squares model that is estimated is:

$Corruption_i = \alpha + \beta\ Decentralization_i + \gamma\ Control\_Variables_i + \varepsilon_i$,

where $Control\_Variables_i$ are share of metropolitan population, average government sector wages and percent of population with at least high school education, and ε_i is the error term.

The results of OLS estimations are presented in Table 8. Column 1 reports the estimations for the base equation. Share of metropolitan population and educational attainment are statistically significantly associated with perception of corruption. The signs are as predicted. Larger share of metropolitan share is associated with more perceived corruption, while higher education attainment of population is negatively related to corruption. Average government wages adjusted for the cost of living is negatively and significantly associated with corruption as well.

Each of the subsequent columns has one of the decentralization indicators added to the base equation. For example, column 3 shows that higher local share of total state and local government revenues is negatively and significantly associated with lower perceived level of corruption.

Columns 4 and 5 show that revenue autonomy and accountability are negatively associated with corruption and the relationship is significant at 1 percent level. These results do not support some of the arguments in the literature that suggest that greater fiscal autonomy of local governments tends to lead to overprovision of public goods and services to local elites at the expense of non-elites, in other words, corruption (Bardhan and Mookherjee 2001). On the contrary, the relationship is very strong both statistically and economically. By looking at the estimated coefficients, one can see that revenue decentralization has more impact on corruption compared to other measures of decentralization. For example, increasing the local share of state and local revenues leads to 0.06 point decrease in corruption perception index, while the local share of state and local expenditures decreases the corruption index by about 0.04 points.

Local share of total state and local government employment and number of local governments are also statistically significantly associated with corruption.

We developed a hypothesis that corruption is lower when government is more decentralized, based on the literature that suggest decentralization creates incentives for local governments to promote healthy economic environment, increases the accountability of local governments to the local residents, and leads to intergovernmental and interjurisdictional competition. Empirical analysis shows that overall fiscal decentralization of the states is associated with lower perceived corruption. Various indicators of decentralization are negatively and statistically significantly associated with the corruption across states in the U.S.

The coefficient estimates of the equations show that the relationships between revenue decentralization, autonomy and corruption are the strongest economically. That

suggests revenue autonomy has the most impact on corruption. That is consistent with the theoretical arguments that suggest that the benefits of decentralization are the greatest if revenue autonomy is devolved to local governments.

Coefficient estimates for the base equation tell an interesting story. If the share of population in metropolitan areas were to increase by one percentage point, then the perception of corruption increases by 0.04 points. One percentage point increase in share of population with high school or higher education decreases corruption by around 0.002 points.

Next, we re-estimate the models with ordered logit, since our dependent variable is not strictly linear variable. Just like the cross country corruption perception indices, the cross state index of corruption perception is based on survey results. As we've discussed earlier, the survey asks the respondents to evaluate their states by answering to a survey that asks them to choose from answers--very high level of corruption to no corruption at all. The results of ordered logit estimations are given in Table 9.

The predictions of the logit model are similar to those of the linear estimations with a few exceptions. All the decentralization indicators are negatively related with corruption and the relationship is statistically significant except for the number of local governments per ten thousand residents. Educational attainment is seldom significantly associated with corruption, although the expected sign is obtained. Overall, all the expected signs are observed. Average wages are not significantly associated with corruption except the case when fiscal decentralization is measured by revenue decentralization, autonomy and accountability. Metropolitan share of population is consistently significantly related with corruption.

The marginal probability effects are reported in Table 10. The results show that the probability of scoring zero on corruption index (which is very low level of corruption) increases with greater decentralization, with the exception of the number of local governments. For example, the probability of state scoring 0 on corruption index increases by 0.0043 percentage points if the revenue autonomy (own source revenues as share of total local government revenues) increases by one percentage point. But, the marginal effects do not say much about the probability of scoring high on corruption scale. Overall, the results of ordered logit estimation confirm the predictions of the linear estimations. Higher share of local expenditures, revenues and employment, revenue autonomy, and local government's fiscal accountability all lead to cleaner score on corruption perception index. In particular the effects of revenue decentralization and revenue autonomy on corruption are relatively greater compared to the other forms of decentralization.

Endogeneity

Just as in a cross country analysis, there is a potential endogeneity problem with the estimation of the relationship between decentralization and corruption in the US. By decentralizing to local levels the state governments would likely to lower the bribes they ask if they compete with local governments for the "bribe base." State governments may be tempted to try to centralize the fiscal responsibilities. If that is the case, then our estimates may suffer from endogeneity bias.

We test for endogeneity of local share of expenditure and revenue, local fiscal autonomy, local government fiscal accountability, local share of employment, and the

number of local governments by estimating the same equations with two stage least squares. The instrumental variables are personal income per capita, state population, and the median distance from local government centers to the state capital. These are proxies for income and size factors and are similar to the ones we've used for cross country study. As we've mentioned before, these are typical instruments used to predict the degree of fiscal decentralization. The Durbin-Wu-Hausman test for endogeneity fails to reject the null hypothesis thus there is no evidence of endogeneity (See Table 9).

CONCLUSION

The main conclusion of the paper is that fiscal decentralization does have a role in how people see their governments. Consistent with the theoretical model, we find that fiscal decentralization induces public officials to reduce bribes they charge per firm thus reducing bribery cost to entrepreneurs. This is verified both by cross country and panel data analysis using various corruption indices. Secondly, fiscal decentralization has a little impact on corruption perception index. In other words, greater fiscal decentralization is not likely to translate into better ranking on corruption perception index. Lastly, not all aspects of decentralization have an equal impact on corruption. Based on a cross state analysis, we find that states that decentralize revenue raising authority and give more revenue authority to local governments were perceived to be less corrupt, while decentralization of expenditure, increase in number of local jurisdictions, and increasing local government employment do not decrease corruption. This is an important result because countries around the world and international organizations are interested in the implications of fiscal decentralization policies. In particular, the effect of various aspects of decentralization on corruptibility of government and the quality of public office are of great interest. Cross country analysis is hampered by the lack of adequate decentralization data. Availability of data for the states makes it possible to test the hypotheses in the literature and suggest that decentralization of government is likely to be associated with lower corruption of government if subnational governments are given revenue autonomy. Cross state analysis of corruption is appealing because there are little cultural, institutional, and political variations across the states that need to be controlled in cross country analysis.

Future research should try to draw a finer line between grand corruption and petty corruption. Grand corruption, also known as political corruption, is a more serious problem than petty corruption (Transparency International 2004c). More theoretical analysis is needed to understand why people see grand corruption as more harmful than petty corruption. One possibility is that people see petty corruption as a way to around the inefficient bureaucracy, just as argued by Leff (1964).

APPENDICES

Table 1. Descriptive Statistics

Variable	Observations	Mean	St. Dev.	Min	Max
Bribe as Percent of Revenues	44	3.88	1.68	0.6	8.6
Convictions per 100,000 people	73	0.85	1.24	0.0	8.6
Percent of People Asked to Pay Bribe	46	12.18	11.81	0.1	59.1
Political Risk due to Corruption	96	2.48	1.29	0.0	5.0
Governance Indicator: Corruption	81	4.06	2.92	0.0	9.0
Corruption Perception Index	74	5.04	2.56	0.0	9.0
Subnational Share of Total Government Expenditures	78	23.33	16.00	1.9	72.8
Economic Freedom Index	156	37.17	14.84	0.0	73.6
Freedom of Press Index	181	53.36	24.34	0.6	94.4
Ethnic Fractionalization Index	184	0.43	0.26	0.0	0.9

Source: Bribes as Percent of Revenues - Investment Climate Surveys of the World Bank Group and the Business Environment and Enterprise Performance Surveys of the European Bank for Reconstruction and Development and the World Bank. Convictions per 100,000 Residents - United Nations Survey on Crime Trends and the Operations of Criminal Justice Systems. Percent of People Asked to Pay Bribes - International Crime Victim Surveys (ICVS), a joint project by United Nations Interregional Crime and Justice Research Institute and United Nations Office on Drugs and Crime. Political Risk of Corruption – *International Country Risk Guide*. The PRS Group, Inc. Corruption Perception Index – Transparency International. Governance Indicator (Corruption) - World Bank Institute. Subnational Share of Total Expenditure- Government Finance Statistics, International Monetary Fund. Economic Freedom – Heritage Foundation. Freedom of Press – Freedom House. Fractionalization – Alesina et al. 2003.

Table 2. Results of OLS and 2SLS Estimations

	Bribe as Percent of Revenues[1]	Convictions per 100,000 people	Percent of People Asked to Pay Bribe	Bribe as Percent of Revenues[1]	Convictions per 100,000 people	Percent of People Asked to Pay Bribe
	[1]	[2]	[3]	[4]	[5]	[6]
Constant	4.06***	4.78**	16.77***	3.86	5.81**	18.81***
	(3.82)	(2.01)	(6.81)	(1.61)	(2.04)	(6.02)
Subnational Share of Total Government Expenditures	-0.20*	-0.55**	-0.44*	-0.16	-0.81*	-1.33**
	(-1.72)	(-2.17)	(-1.70)	(-0.33)	(-1.94)	(-2.04)
Economic Freedom Index	-0.60	-1.21	-3.23***	-0.58	-1.28	-3.11**
	(-1.60)	(-1.47)	(-2.89)	(-1.47)	(-1.51)	(-2.42)
Freedom of Press Index	-0.02	0.03	-0.22	-0.01	0.03	-0.17
	(-0.19)	(0.06)	(-0.20)	(-0.03)	(0.05)	(-0.09)
Ethnic Fractionalization Index	0.03	-0.18	0.78***	0.05	-0.25	0.87***
	(0.19)	(-0.90)	(2.88)	(0.18)	(-1.11)	(2.77)
Method of Estimation	OLS	OLS	OLS	2SLS	2SLS	2SLS
# observations	29	57	41	29	56	41
R^2	0.23	0.12	0.61	0.07	0.10	0.21

Source: See Table 1.

Note: t-statistics are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Data are averages of 1996-2002. All variables are in logarithms.

For 2SLS R^2 from the first stage is reported.

[1] includes only developing and transition countries.

Table 3. Results of OLS and Ordered Logit Estimations

	Political Risk due to Corruption	Governance Indicator: Corruption	Corruption Perception Index	Political Risk due to Corruption	Governance Indicator: Corruption	Corruption Perception Index
	[1]	[2]	[3]	[4]	[5]	[6]
Constant	5.16***	10.51***	11.16***			
	(11.68)	(14.13)	(14.97)			
Subnational Share of Total	-0.010*	-0.008***	-0.022**	-0.014	-0.018	-0.026*
Government Expenditures	(-1.88)	(-2.98)	(-2.28)	(-1.21)	(-1.41)	(-1.83)
Economic Freedom Index	-0.03***	-0.12***	-0.12***	-0.05**	-0.15***	-0.16***
	(-2.83)	(-7.04)	(-7.27)	(-2.46)	(-6.72)	(-5.79)
Freedom of Press Index	-0.03***	-0.04***	-0.02**	-0.05***	-0.05***	-0.04**
	(-3.89)	(-4.14)	(-2.05)	(-3.71)	(-3.82)	(-2.38)
Ethnic Fractionalization	0.52	3.36***	2.87***	1.32	4.47***	4.27***
Index	(1.28)	(4.71)	(4.25)	(1.44)	(4.61)	(4.06)
μ_1				1.43***	2.36***	2.76***
μ_2				2.97***	3.53***	3.53***
μ_3				5.78***	4.93***	4.37***
μ_4				8.11***	5.63***	5.26***
μ_5				8.67***	6.66***	6.74***
μ_6					7.77***	7.98***
μ_7					8.96***	10.39***
μ_8					10.28***	13.68***
μ_8					13.25***	15.07***
Method of Estimation	OLS	OLS	OLS	Ordered Logit	Ordered Logit	Ordered Logit
# observations	96	81	74	96	81	74
R^2 (Pseudo R^2)	0.53	0.78	0.77	0.22	0.31	0.31
Log Likelihood Function				-117.97	-126.12	-105.94

Source: See Table 1; Note: t-statistics are in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Data are averages of the period 1996-2002 in models 2,3,5, and 6. In models 1 and 4, variables are averaged over the period 1984-2002. [1] includes only developing and transition countries.

Table 4. Marginal Effects for Ordered Logit Models

CORICRG	=0	=1	=2	=3	=4	=5				
DECENTRA	0.0005	0.0011	0.0019	-0.0024	-0.001	-0.0001				
	(0.0004)	(0.0009)	(0.0017)	(0.0035)	(0.001)	(0.0002)				
ECONFREE	0.0017**	0.0041**	0.007**	-0.0087	-0.0036	-0.0005				
	(0.0008)	(0.0018)	(0.0033)	(0.0084)	(0.0024)	(0.0004)				
ETHFRAC	-0.0417	-0.1016	-0.1727	0.2156	0.089	0.0114				
	(0.0297)	(0.071)	(0.1098)	(0.1552)	(0.0744)	(0.0124)				
PRESSFRE	0.0017***	0.0042***	0.0071***	-0.0088	-0.0036	-0.0005				
	(0.0006)	(0.0012)	(0.0025)	(0.0105)	(0.0025)	(0.0005)				
CORRUPT	=0	=1	=2	=3	=4	=5	=6	=7	=8	=9
DECENTRA	0.0001	0.0011	0.0017	0.0017	-0.0005	-0.0018	-0.0014	-0.0006***	-0.0002	-0.0001
	(0.0001)	(0.0008)	(0.0032)	(0.0031)	(0.0012)	(0.002)	(0.0019)	(0.0002)	(0.0002)	(0.0001)
ECONFREE	0.0011***	0.009***	0.014	0.0133	-0.0043	-0.0142	-0.0111	-0.0052**	-0.0018	-0.0007**
	(0.0003)	(0.0022)	(0.0218)	(0.0265)	(0.009)	(0.0141)	(0.0158)	(0.0021)	(0.0011)	(0.0003)
ETHFRAC	-0.0323***	-0.2683***	-0.4172	-0.3984	0.13	0.424	0.3325	0.1543**	0.0548	0.0206**
	(0.0096)	(0.0742)	(0.5711)	(0.85)	(0.276)	(0.4167)	(0.466)	(0.0658)	(0.0351)	(0.0099)
PRESSFRE	0.0004***	0.003***	0.0047	0.0045	-0.0015	-0.0048	-0.0038	-0.0017**	-0.0006	-0.0002**
	(0.0001)	(0.0009)	(0.0075)	(0.0082)	(0.003)	(0.0047)	(0.0055)	(0.0008)	(0.0004)	(0.0001)
CPI	=0	=1	=2	=3	=4	=5	=6	=7	=8	=9
DECENTRA	0.0000	0.0005*	0.0005	0.0011	0.0019	0.0024	-0.0021	-0.0037***	-0.0006	0.0000
	(0.0000)	(0.0003)	(0.0019)	(0.0012)	(0.0013)	(0.0038)	(0.0013)	(0.0009)	(0.0004)	(0.0000)
ECONFREE	0.0002***	0.0028***	0.0031	0.0067	0.0116**	0.0147	-0.0127	-0.0227***	-0.0035*	-0.0001**
	(0.0001)	(0.0008)	(0.0108)	(0.0067)	(0.0047)	(0.0204)	(0.008)	(0.0065)	(0.0019)	(0.0001)
ETHFRAC	-0.0053***	-0.0762***	-0.0857	-0.183	-0.3154*	-0.4001	0.346	0.6196***	0.0962*	0.0039*
	(0.0018)	(0.0255)	(0.2787)	(0.1924)	(0.1648)	(0.5874)	(0.2144)	(0.203)	(0.051)	(0.0022)
PRESSFRE	0.0000**	0.0007**	0.0008	0.0017	0.003**	0.0038	-0.0033	-0.0058**	-0.0009	0.0000
	0.0000	(0.0003)	(0.0029)	(0.0022)	(0.0012)	(0.0055)	(0.0022)	(0.0028)	(0.0006)	(0.0000)

Note: Standard Errors are in parentheses; Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 5. Panel Data Estimations

Dependent Variable:	Political Risk Due to Corruption	
Constant	4.09***	
	(13.98)	
Subnational Share of Total Government Expenditures	-0.008**	-0.014*
	(-2.42)	(-1.83)
Economic Freedom Index	-0.02***	-0.03**
	(-2.65)	(-2.41)
Freedom of Press Index	-0.02***	-0.05***
	(-5.81)	(-6.94)
Ethnic Fractionalization Index	1.27***	2.41***
	(4.71)	(4.36)
μ_1		1.77***
		(11.74)
μ_2		3.25***
		(21.41)
μ_3		5.84***
		(25.65)
μ_4		8.61***
		(16.25)
μ_5		7.50***
		(12.1)
Method of Estimation	Random Effects	Ordered Logit
Hausmann test: H value	3.98	
# observations	248	280
R^2 (Pseudo R^2)	0.47	0.19
Log Likelihood Function		-354.17

Source: See Table 1.
t-statistics are in parentheses

Table 6. Marginal Effects for Ordered Logit Models

CORICRG	=0	=1	=2	=3	=4	=5
ECONFREE	0.0022***	0.0024**	0.0006	-0.0027***	-0.0019	-0.0006
	(0.0008)	(0.0010)	(0.0022)	(0.0004)	(0.0015)	(0.0007)
PRESSFRE	0.0031***	0.0032***	0.0009	-0.0038***	-0.0026	-0.0009
	(0.0007)	(0.0010)	(0.0030)	(0.0013)	(0.0021)	(0.0007)
ETHFRAC	-0.1771***	-0.1885***	-0.0506	0.2186***	0.1467	0.0508
	(0.0423)	(0.0521)	(0.1799)	(0.0487)	(0.1523)	(0.0428)
DECENTRA	0.0010***	0.0011**	0.0003	-0.0013**	-0.0009	-0.0003
	(0.0004)	(0.0005)	(0.0010)	(0.0005)	(0.0010)	(0.0003)

Table 7. Summary Statistics, Cross State Data for the USA

Variables	Observations	Mean	Std Dev	Min	Max
Corruption Perception Score [a)]	45	3.5	1.2	1.5	5.5
Modified Corruption Perception Score [b)]	45	2.0	1.2	0.0	4.0
Metropolitan Population Share	45	67.1	20.4	27.9	96.7
Average Government Wages Adjusted for Cost of Living	45	2722	313	2266	3544
Educational Attainment	45	83.6	4.2	76.3	90.7
Local Share of State and Local Government Expenditures	45	53.8	7.5	35.3	67.0
Local Share of State and Local Government Revenues	45	40.7	6.8	19.7	55.7
Own Source Revenues as a Share of Total Local Government Revenues	45	61.1	6.2	44.5	71.3
Share of Local Government Expenditures Financed by Own Source Revenues	45	62.6	7.1	45.2	73.6
Local Share of State and Local Government Employment	45	68.8	6.2	46.5	78.2
Number of local governments per 10,000 residents	45	6.0	7.4	0.7	42.6

Source: [a)] (Boylan and Long 2003)
All other data are from the U.S. Census <www.census.gov>
Data except corruption are averaged over 1997-1999.
[b)] Corruption Perception Scores were rounded to get an ordered Corruption Perception Scores.

Table 8. Ordinary Least Square Estimates

Dependent Variable:	Modified Perception of Corruption						
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Constant	11.51***	11.96***	12.25***	13.94***	12.92***	14.80***	10.59***
	(4.09)	(4.41)	(4.74)	(5.06)	(4.68)	(4.86)	(3.81)
Metropolitan Share of State Population	0.04***	0.04***	0.05***	0.05***	0.05***	0.04***	0.03**
	(3.75)	(4.16)	(4.82)	(4.83)	(4.48)	(3.87)	(2.62)
Average Government Wages Adjusted for	-0.002**	-0.001*	-0.002***	-0.002***	-0.002***	-0.001*	-0.002**
Cost of Living	(-2.42)	(-1.88)	(-2.96)	(-3.50)	(-3.20)	(-1.94)	(-2.34)
Percent of Population with High School or	-0.09***	-0.08**	-0.07**	-0.06	-0.06	-0.10***	-0.07*
Higher Education	(-2.47)	(-2.34)	(-2.08)	(-1.60)	(-1.61)	(-2.84)	(-1.94)
Local Share of State and Local Government		-0.043**					
Expenditures		(-2.11)					
Local Share of State and Local Government			-0.063***				
Revenues			(-3.00)				
Own Source Revenues as a Share of Total				-0.063***			
Local Government Revenues				(-2.76)			
Share of Local Government Expenditures					-0.045**		
Financed by Own Source Revenues					(-2.20)		
Local Share of State and Local Government						-0.050**	
Employment						(-2.28)	
Number of Local Governments per 10,000							-0.042*
Residents							(-1.81)
Number of Observations	45	45	45	45	45	45	45
R^2	0.44	0.50	0.54	0.53	0.50	0.50	0.48

Source: See Table 5.
Note: t-statistics are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.
Data are averaged for the period 1997-1999.

Table 9. Two Stage Least Square Estimates

Dependent Variable:	Modified Perception of Corruption					
	[1]	[2]	[3]	[4]	[5]	[6]
Constant	11.97***	12.21***	12.51***	11.74***	-15.56	9.55
	(4.41)	(4.70)	(4.01)	(3.87)	(-0.03)	(0.92)
Metropolitan Share of State Population	0.04***	0.05***	0.04***	0.04***	0.04	0.02
	(4.14)	(4.50)	(3.46)	(3.10)	(0.45)	(0.19)
Average Government Wages Adjusted for Cost	-0.001*	-0.002***	-0.002**	-0.002**	-0.005	-0.001
of Living	(-1.82)	(-2.92)	(-2.39)	(-2.05)	(-0.09)	(-1.20)
Percent of Population with High School or	-0.08***	-0.07**	0.08*	-0.08*	-0.02	-0.05
Higher Education	(-2.32)	(-2.06)	(1.87)	(-1.95)	(-0.01)	(-0.25)
Local Share of State and Local Government	-0.04					
Expenditures	(1.61)					
Local Share of State and Local Government		-0.055*				
Revenues		(-1.86)				
Own Source Revenues as a Share of Total			-0.026			
Local Government Revenues			(-0.64)			
Share of Local Government Expenditures				-0.007		
Financed by Own Source Revenues				(-0.20)		
Local Share of State and Local Government					0.413	
Employment					(0.06)	
Number of Local Governments per 10,000						-0.09
Residents						(-0.19)
Number of Observations	45	45	45	45	45	45
R^2 from first stage	0.61	0.43	0.11	0.12	0.46	0.20

Source: See Table 5.
Note: t-statistics are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.
Data are averaged for the period 1997-1999.

Table 10. Ordered Logit Estimations

Dependent Variable:	Modified Perception of Corruption						
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Metropolitan Share of Population	0.08***	0.10***	0.12***	0.12***	0.11***	0.08***	0.06
	(2.93)	(3.11)	(3.67)	(3.24)	(3.21)	(2.82)	(1.54)
Average Government Wages Adjusted for	-0.003	-0.003	-0.004**	-0.005**	-0.005**	-0.003	-0.003
Cost of Living	(-1.58)	(-1.11)	(-2.1)	(-2.4)	(-2.22)	(-1.15)	(-1.43)
Percent of Population with High School or	-0.17*	-0.16	-0.15	-0.11	-0.12	-0.22*	-0.11
Higher Education	(-1.68)	(-1.43)	(-1.15)	(-0.96)	(-1.06)	(-1.83)	(-0.85)
Local Share of State and Local Government		-0.11**					
Expenditures		(-1.98)					
Local Share of State and Local Government			-0.17***				
Revenues			(-2.78)				
Own Source Revenues as a Share of Total				-0.16**			
Local Government Revenues				(-2.53)			
Share of Local Government Expenditures					-0.10**		
Financed by Own Source Revenues					(-2.08)		
Local Share of State and Local Government						-0.14**	
Employment						(-2.03)	
Number of Local Governments per 10,000							-0.15
Residents							(-1.26)
μ_1	15.02***	17.56***	20.02***	23.27***	19.97***	26.06***	12.48***
μ_2	17.03***	19.89***	22.61***	25.61***	22.17***	28.43***	14.49***
μ_3	18.75***	21.78***	24.52***	27.40***	23.92***	30.27***	16.31***
μ_4	21.01***	24.05***	26.93***	29.91***	26.38***	32.63***	18.96***
Percent Correctly Predicted	44	58	51	40	38	53	51
Log Likelihood Function	-56.41	-53.46	-51.09	-52.53	-53.96	-53.01	-53.59
Pseudo R^2	0.17	0.22	0.25	0.23	0.21	0.22	0.21

Source: See Table 5. Sample size is 45; Note: t-statistics are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 11. Marginal Effects for Ordered Logit Models

Estimated Parameters (standard errors in parentheses)	Y=0	Y=1	Y=2	Y=3	Y=4
Metropolitan Share of Population	0.0059*	0.0268	0.0042	-0.0272	-0.0097
	(0.0032)	(0.0126)	(0.2442)	(0.0911)	(0.0234)
Average Government Wages Adjusted for	0.0001**	0.0005	0.0001	-0.0005	-0.0002
Cost of Living	(0.0001)	(0.0002)	(0.0048)	(0.002)	(0.0005)
Percent of Population with High School or	-0.0028**	-0.0129	-0.002	0.0131	0.0047
Higher Education	(0.0011)	(0.0038)	(0.1183)	(0.049)	(0.0118)
Local Share of State and Local Government	0.0034*	0.0172	0.0047	-0.0204	-0.005
Expenditures	(0.0018)	(0.0076)	(0.1753)	(0.0793)	(0.0138)
Local Share of State and Local Government	0.0043**	0.0253	0.0069	-0.0308	-0.0056
Revenues	(0.0019)	(0.009)	(0.2601)	(0.1265)	(0.0161)
Own Source Revenues as a Share of Total	0.0043**	0.0261	0.0036	-0.0275	-0.0065
Local Government Revenues	(0.0021)	(0.0102)	(0.2625)	(0.1247)	(0.0211)
Share of Local Government Expenditures	0.0031*	0.0175	0.0021	-0.0178	-0.0049
Financed by Own Source Revenues	(0.0017)	(0.0083)	(0.1644)	(0.075)	(0.0152)
Local Share of State and Local Government	0.004**	0.0216	0.0055	-0.0251	-0.006
Employment	(0.002)	(0.009)	(0.2512)	(0.1089)	(0.0161)
Number of Local Governments per 10,000	0.0038	0.0262	0.0017	-0.024	-0.0077
Residents	(0.0025)	(0.0145)	(0.2474)	(0.1245)	(0.0228)

Source: See Table 5. Sample size is 45; Note: *** p<0.01, ** p<0.05, * p<0.1.

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