CAUSES OF CORRUPTION: AN EMPIRICAL INVESTIGATION IN A CROSS-COUNTRY FRAMEWORK

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ABSTRACT

In recent years corruption has come to be considered as a pervasive phenomenon, and a major obstacle in the process of economic development. However, there exist few studies that discuss the factors that cause corruption and why some countries are more corrupt than others. This research contributes to that rather scanty literature and focuses on the causes of corruption. More importantly, the study empirically investigates various causes of corruption, in particular the role of economic development, democracy and economic freedom in explaining the observed variations in corruption across countries, and the nexus between democracy and economic freedom in combating corruption.

The study first tests the reliability of the recent quantitative innovations in the study of corruption in terms of the Corruption Perception Index, constructed by Transparency International. Using theoretical and empirical analysis, various hypotheses regarding corruption and its determinants are examined using panel data for 100 countries during the period 1995 to 2004. The empirical findings show that the subjective indexing process of corruption perception eventually converges to a common consensus. In evaluating the relationship between economic development and corruption, the results suggest that income per capita, education, unemployment, income inequality, economic freedom and democracy are among the factors which determine and help explain the cross-country differences in corruption. Furthermore, the assessment of the relationship between democracy and corruption shows that an 'electoral democracy', represented by 'political rights', is not in itself sufficient to reduce corruption. Instead, for low levels of corruption to exist, the presence of an advanced fully-formed mature democracy is required.

A characteristic of a mature democracy is the existence of an environment where the probability of being caught, if acting corruptly, is very high. In addition, the examination of the interaction between economic freedom and democracy suggests that economic freedom reduces corruption in any political environment, and the effect

is substantially larger with a high level of democracy. The interesting and important findings of the analysis indicate that there exists a non-linear relationship between corruption and the level of income as well as democracy. The findings suggest that developed countries have succeeded in controlling corruption through higher levels of economic development along with the economic and political freedoms that their peoples enjoy.

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LIST OF ABBREVIATIONS

2SLS	Two Stage Least Squares
CCI	Control of Corruption Index
CPI	Corruption Perception Index
FDI	Foreign Direct Investment
FE	Fixed Effect
GDP	Gross Domestic Product
HICs	High-Income Countries
IV	Instrumental Variable
LICs	Low-Income Countries
MCLEAN	Mostly-Clean Countries
MCOR	Most-Corrupt Countries
MEDCOR	Medium-Corrupt Countries
MICs	Middle-Income Countries
OECD	Organisation for Economic Co-operation and Economic Development
OLS	Ordinary Least Squares
PFERD	Period Fixed Effect with Regional Dummies
PLS	Panel Least Squares
RE	Random Effect
TI	Transparency International
US	United States

CHAPTER 1

Introduction

1.1 Background of the Thesis

Corruption has been around in the world for a very long time, but the issue of corruption has come to attract renewed interest, both among academics and policy makers, particularly over the last decade. There are several reasons why this topic has come under fresh scrutiny. First, there is a consensus about corruption at the present time that it is pervasive and universal. It exists in both advanced and poor countries, in public and private sectors, and even in the non-profit and charitable organisations (World Bank, 1997). Second, corruption scandals have come to play a more central role in politics in recent years. For example, Governments have been toppled, careers of world-renowned public figures ruined, and the reputations of well-respected organisations and businesses tarnished on the account of publicised corruption. Good illustrations of these include the fall of the Marcos government in the Philippines (The New York Times, February 26, 1986) and the fall of the corporate Enron in the United States (Healy and Palepu, 2003). Shleifer and Vishny (1994) note that in Greece a high turnover of all employees along with top managers of public enterprises when an opposition party wins an election.

Third, and the most important issue, is that corruption can be a major obstacle in the process of economic development and modernisation of a country. Many now consider that, in most developing countries, public corruption constitutes one of the top three or four most harmful influences (Klitgaard, 1988). Mauro (1995) finds that in some developing countries, such as Zaire, Kenya and Indonesia, the money value of corruption probably amounts to a large fraction of Gross National Product. In a survey of 150 high level officials from 60 developing countries, the respondents ranked public sector corruption as the most severe obstacle to the development process (Kaufmann, 1998). In the transition countries, the shift from being command to free market

economies has seemingly created massive opportunities for the appropriation of rents (i.e. excessive 'unearned' profits). It seems also to have often been accompanied by a change from a well-organised system of corruption to a more chaotic and deleterious one (Shleifer, 1997). Slow economic growth has persisted in many countries with malfunctioning institutions, owing largely to the prevalence and spread of corrupt officials and institutions.

The motivation of this study derives from the widespread and growing concern about corruption, particularly in the context of developing countries. Recent empirical research on the consequences of corruption corroborates its detrimental effects which lead to the consensus that it is one of the central issues in development policies. It weakens a country's institutional foundations, investment and decision making which, consequently, contribute to lower economic growth. However, research on what causes corruption and why some countries are more corrupt than others is rather scanty. Given its large negative impact, much stands to be gained from understanding the causes of corruption and the way in which it can be reduced. This is one of the major motivations of this research.

1.2 Aims and Objectives

To a large extent, economists and policy-makers have remained uncertain about what can be done to reduce corruption. To provide coherent policy guidelines to curb corruption, it is important to study its causes and variations across countries. Only after determining the causes of corruption, can policy recommendations of how to combat corruption be prescribed. Ades and Di Tella (1997) describe three types of policy proposal aimed at curbing corruption, viz. the lawyer's, the businessman's and economist's approach. These in a nutshell are as follows: the lawyer's approach recommends new tougher laws and tougher enforcement of existing laws; the businessman's approach advocates paying higher wages and other compensations to bureaucrats, and economists propose increasing the level of competition in the economy, both among firms and bureaucrats. Following these approaches, this study pays

particular attention to the role of economic development, democracy and economic freedom in curbing corruption.

Real gross domestic product (GDP) per capita captures the level of economic development, along with other factors such as the literacy rate, the level of education, unemployment rate and income inequality. Taking all these factors into consideration the study first seeks to answer an important question related to economic development; viz. is the level of corruption lower in more developed countries than in developing countries? Whereas democracy encompasses the rule of law, which entails traditional ideas about liberty and natural justice, and, more generally, ideas about the requirements of justice and fairness in the relations between the government and the governed (Allan, 1993, p. 21). Democracy is also a means for enforcement of laws. Thus, the second question to be answered is whether democracy, where the probability of getting caught and punished by taking a bribe is high, reduces corruption. The third question raised in this study is which factor (i.e. democracy or economic freedom) is more effective in combating corruption.

The thesis makes five sets of contributions to the corruption literature on the cross-sectional variation amongst countries. First, it provides a deeper analysis of the corruption perception index to justify the reliability of using the perceptions-based subjective indices in the empirical investigations. It can be argued that less variation in the perception of corruption increases the predictability of the level of corruption and, in turn, increases the scope for using perception-based indices in the literature.

Second, the thesis provides a framework of empirical analysis by categorising countries into regions and by income groups to account for the observed phenomenon as to why high levels of per capita income are associated with less corruption in developed countries. To the best of our knowledge, it offers the first systematic cross-country non-linear examination focusing on a non-monotonic relationship between income per capita and the level of corruption.

Third, the study presents a theoretical analysis as to why a mere transition toward democracy is insufficient to reduce corruption, but an advanced democratic political system is found to be more effective in restraining corruption. Also, some further supportive evidence on the overall structure of the democracy-corruption relationship in the model is examined. Non-linear relationships between democracy and corruption are tested.

Fourth, the thesis examines the impact of economic freedom and the interaction between democracy and economic freedom in controlling corruption in a theoretical and empirical framework. The partial estimation analysis tests whether democracy or economic freedom is more crucial for combating corruption. In particular, does greater economic freedom or greater political freedom yield a more 'corruption free' society?

The final contribution is methodological. In a panel estimation framework this study tests the explanatory power of income per capita, democracy and economic freedom in explaining the variation in corruption. Previous cross-national studies on the causes of corruption have primarily used cross-sectional ordinary least squares (OLS) methods. The panel estimation technique allows for controlling heterogeneity for each unit in the sample, and for possible endogeneity in some regressors. Fixed effects (FE), a range of instrumental variables, and two-stage least squares (2SLS) methods are utilised to correct for these problems. The empirical estimations analysed here have used a wide array of controls as well as different measures of corruption to test the robustness of the results. The next section provides an overview of the thesis.

1.3 Chapter Outline

The thesis is organised as follows: this chapter outlines the aims and objectives, and the importance of the study of corruption. In Chapter 2, a literature review of previous studies on various causes and consequences of corruption is presented. Both the static and the dynamic aspects of corruption are considered in the discussion of this chapter. It also discusses the concept of corruption and its different forms. The various definitions

of corruption and the difficulty in the measurement of corruption are noted in this chapter.

Chapter 3 evaluates the corruption perception index in greater depth. This chapter analyses the subjective indices of corruption using the Transparency International's corruption perception index (CPI). The hypotheses to be tested are whether these indices are persistent and whether they converge towards some sort of a general agreement over time. This is done by categorizing countries into most-corrupt, medium-corrupt and mostly-clean groups. The results confirm the reliability of CPI as a credible quantitative measure of corruption.

Chapter 4 presents an empirical analysis of the causes of corruption. In examining the various hypotheses, the study seeks to answer the important question relating to the nexus between corruption and economic development by income classification of the countries and by regions. The main hypothesis being examined here is whether the level of corruption is lower in the more developed countries than it is in the developing countries. Within this context, the following hypotheses will be examined: (i) Is corruption lower where the levels of education are high; (ii) does higher income inequality increase corruption? (iii) Is corruption higher where the levels of unemployment are high; (iv) does the level of democracy and economic freedom reduce the level of corruption? The findings will contribute to a better understanding of the causes of corruption.

Chapter 5 examines the role of democracy in controlling corruption from a theoretical perspective. In particular, does democracy necessarily reduce the level of corruption? An analytical model of the role of a well-functioning democracy for controlling corruption is presented. Chapter 6 provides the empirical evidence of democracy-corruption relationship. This chapter tests the hypotheses suggested in Chapter 5. The cross-country study presented in this chapter examines the following hypotheses: (i) Is 'narrow-democracy' represented by 'political rights' sufficient enough to control corruption? (ii) Is an advanced, fully-formed, mature, democracy, denoted by 'broad-

democracy', crucial in combating corruption? (iii) Does a non-linear relationship exist between democracy and corruption?

Chapter 7 analyses the interaction effect of economic freedom and democracy on corruption, i.e. it examines the joint effects of economic freedom and democracy in controlling corruption. In particular, two hypotheses will be examined: (i) Is it true that democracy is a cure for corruption in any environment? (ii) Does economic freedom work more or less effectively in controlling corruption in an environment that enjoys more political freedom? Chapter 8 presents the conclusion and indicates avenues for further research. The Chapter reviews the theoretical and empirical framework, the findings reported in the earlier chapters, and draws out the implications of those findings for scholars and policy makers.

CHAPTER 2

Corruption: Literature Review

2.1 Introduction

The term "corruption" has been given a lot of attention, especially at the onset of the twenty-first century, as this phenomenon has increasingly come to affect the economic performance of nations, particularly the developing countries. Various studies on the consequences of corruption highlight its harmful effects on growth (Klitgaard, 1988; Shleifer and Vishny, 1993; Mauro, 1995; Bardhan, 1997). The World Bank (2005) study identifies corruption as one of the major obstacles to economic and social development for the poor. Transparency International (TI) has published data on the level of corruption in terms of Corruption Perception Index (CPI) since 1995. Its 2003 Report notes, “nine out of ten developing countries urgently need practical support to fight corruption” (Transparency International, 2003, p. 2). The purpose of this chapter is to provide an overview of the existing theoretical and empirical literature on corruption with a view to highlighting the causes of corruption, its impact on growth and the factors found to explain its impact at the national and individual levels.

The chapter is arranged as follows: the next section provides a brief survey of the concept of corruption. Section 2.3 discusses the effects of corruption by categorizing its effect on growth (national level), efficiency (sectoral level) and income distribution (individual level). Section 2.4 discusses the factors behind various incidents of corruption and section 2.5 provides evidence on the causes of corruption. Lastly, section 2.4 provides a summary which points out the gaps in the existing literature, that is, what has been learnt so far, and what needs to be done to control corruption.

2.2 The Concept of Corruption

Corruption takes a variety of forms and exists at various levels. Consequently, a major predicament in studying corruption lies in how to define corruption. Bardhan and Mookherjee (2005) argue that the definitions used in the analysis may affect the conclusions drawn from the empirical studies or normative policy exercises.

The definitions of corruption used in the corruption literature differ widely. The purpose of this section is to provide an overview of the literature on this subject and make an effort to provide a common framework to identify what is corruption and what types of activities are considered to be corrupt.

2.2.1 What is corruption?

In spite of corruption's universal existence, there is no common definition of it. Several studies have broadly identified three types of corruption in a democratic society based on the relationship between the general public and the government (Rose-Ackerman 1978; Jain 2001). Generally, the nature of the relationship can be identified in three forms, viz. the relationships with the political elites, the administrative elites and the judicial elites. Corresponding to each of the relationships three different types of corruption can occur in a democratic society.

First, political corruption refers to corrupt acts of political leaders and activities by which they exploit their discretionary power to make national policies serve their own interests. Consider such examples as those of the Marcos regime in the Philippines, and the Suharto regime in Indonesia. With this type of corruption, public spending is diverted to those sectors where gains from corruption are the greatest and little attention may be paid to the needs of the majority of the population (Porta and Vannucci, 1997). However, it is difficult to identify and measure political corruption because at least some parts of the society gain from the policies made by the corrupt political leaders (Jain, 2001). Lobbying activities provide the clearest example of this type of activity.

Rose-Ackerman (1978, pp. 35-36) argues that interest groups make campaign contributions to political leaders instead of paying illegal bribes just to make sure that the political leaders will serve them by making favourable policies, if elected. She further states that when money has a broader political usage than bribe paying, the illegality of bribery and the legality of certain campaign contributions make politicians always prefer to take other forms of payment than cash transfers. Moreover, politicians may try to protect themselves by arranging for bribes to be paid to aides, spouses, or business associates; and if they do accept money directly, they must spend it discreetly to avoid arousing suspicions. In this context, Shleifer and Vishny (1993) point out that the demands of secrecy can shift a country's investments away from the highest value projects, such as health and education, into potentially less valuable projects, such as defense and infrastructure, if the latter offers better opportunities for secret corruption. The demand for secrecy can also cause the leaders of a country to preserve monopolies, to prevent entry and to discourage innovation by outsiders, as expanding the ranks of the elite can expose existing corruption practices.

Second, bureaucratic corruption refers to the corrupt acts of the bureaucrats in dealings with either their superiors or with the public.[7] In most of the cases, the public may be required to bribe bureaucrats either to receive a service to which they are entitled or to speed up a bureaucratic procedure (Kaufman, 1997). In some cases, a bribe may even provide a service that is not supposed to be available (Bardhan, 1997). Third, legislative corruption is the one most likely to be found thriving in electoral democracies. Legislative corruption refers to the manner and the extent to which the voting behaviour of legislators can be influenced. In this type of corruption, legislators can be bribed by interest groups to enact legislation that can generate or change the economic rents associated with assets (Rose-Ackerman, 1999).

The existing literature also classifies corruption as grand corruption and petty corruption (Jain, 2001). Grand corruption generally refers to the corrupt acts of the political elite at

[77] See Jain (2001, p. 75) for details.

the highest levels of the society. Political corruption is commonly known as grand corruption. On the contrary, petty corruption refers to the corruption in ordinary people's daily lives, such as bribes paid for licenses or traffic violations. Bureaucratic or administrative corruption is synonymous with petty corruption. Petty corruption is more widespread in developing countries than developed ones. Transparency International's *Regional Survey Report* 2002 on South Asia finds "petty corruption to be endemic in all key public sectors in the five countries, with users reporting moderate to high levels of corruption in their regular interaction with public services."[8]

Bardhan (1997) argues that, even if we confine ourselves only to the economic context, there are alternative divisions drawn between different forms of economic corruption. For example, we have centralised and decentralised corruption as described by Shleifer and Vishny (1993), and well-organised and chaotic corruption, as distinguished by Mauro (1998). In centralised corruption, the government acts like a monopolist to maximise the value of the total amount of bribes paid. On the other hand, in decentralised corruption, individual corrupt officials act to maximise their revenue, and ignore the negative externality they inflict on each other. Thus, decentralised corruption has a higher bribe per unit, but total revenue from bribes is smaller. Now consider the distinction made by Mauro (1998) between well-organized corruption and chaotic corruption. Under well-organised corruption, bribees have a lucid idea to whom and how much to bribe to obtain a favour. In contrast, under chaotic corruption, people are not sure how much to pay and to whom payment is to be made, and more uncertainty is involved about delivery of service and payment of further bribes.

Like different forms of corruption, different levels or structures of corruption exist as well. Waller et al. (2002) examine the link between the number of vertical bureaucratic layers and corruption in a situation where corruption is centralised. Cheung (1998) and Rose-Ackerman (1999) develop the idea of bottom-up and top-down corruption. Bottom-up corruption refers to a setting in which corruption decisions are decentralised

[8] See the regional survey report "Corruption in South Asia" prepared by Transparency International (2002), p.2 for details.

at the lower level of officials. In this form of corruption, the senior-most person is simply one among many collectors of bribes; whereas top-down corruption refers to a setting in which corruption decisions are centralised by the chief authority who, then, monitors lower-level officials in an attempt to collect bribes. In a theoretical model they show that, when a government has high monopoly power and lower public sector wages, adding a layer of government increases the total amount of corruption. In contrast, with high public wages, centralisation of corruption at the top of government hierarchy redistributes the bribe income from the lower to upper level whereby the total amount of corruption is reduced.

The various forms in which corruption exist lead to the lack of a universal definition, while the causes and consequences of corruption also differ. For example, the effect and nature of corruption by political leaders are not the mirror images of bureaucratic corruption. Corrupt politicians exploit their power to make economic policies. As elected officials, politicians are supposed to make decision of resource allocation solely based upon the interests of their principal – the populace. Instead, corrupt political elites can change the national policies to serve their own interests (to remain in power and maximise their personal wealth) at some cost to the populace (Jain, 2001). On the other hand, corrupt bureaucrats exploit their power to extract bribes while carrying out tasks assigned to them by their superiors - the political elite. Moreover, there are different variations of bribes that constitute bureaucratic corruption. Rose-Ackerman (1998) identifies three sub-categories of bribe for bureaucratic corruption: bribes that equate to demand and supply, bribes as incentive payments for bureaucrats and bribes that lower costs. Kaufman (1997) provides an amusing variation of bureaucratic corruption. Officials in India, it appears, cannot always speed up bureaucratic processes, but can promise to slow down the approval process of rival companies.

Finally, in recent years there is a growing concern over corruption in the private sector, especially in developed countries. Good illustrations of private sector corruption are the fall of the One Tel business in Australia, and Enron in the United States. Like public sector officials, private sector officials may abuse their office for private gains.

However, the conventional view regards corruption as the misuse of public offices only (Jain, 2001).[9] The basic explanation lies in the fact that public officials are expected to act in the interest of the public; while a different set of expectations are assigned to the members of the private sector. In general, the primary rationale behind a private agent's activities is to maximise profit for private enrichment and there is no social interest involved with the activities of private agents. Occasionally, in the process of making profit, the private sector's activities may go against the interests of the public; while the public sector is supposed to restrain the activities of the private sector to protect the public interest.[10]

The differing goals of the private sector from the public sector make it tricky to use the word corruption to represent its unethical activity. However, the existing literature considers private sector corruption as the supply side of bribes. Private agents normally always require public goods for the fulfilment of their economic activity, and, if they do not obtain them through the normal process, then private agents offer bribes to public officials, and corruption emerges. Furthermore, sometimes private sector firms pay bribes so as to get away with bad behaviour such as ignoring health and safety regulations or having business rivals stopped or thwarted. Rose-Ackerman (1978) examines the issue of private sector corruption and notes that a private firm wishes to maximise profits. Thus, some illegal behaviour can be encouraged because it increases profits, and the behaviour is tolerated because it is often too costly to be eliminated.

2.2.2 Measurements of corruption

Like the difficulties of defining corruption, measuring or quantifying corruption is also a difficult task because of its various forms. However, some kind of measurement or standard is required when comparing corruption across countries because, without it, it is difficult to make appropriate comparison. For instance, often it is asserted that

[9] This definition of corruption includes activities such as sale of public property by government officials, bribery, and extortion.

[10] For example, fraud, money laundering and black market operations are definitely always against the public interest. No one can deny that some of these activities are closely connected to corruption.

developing countries are more corrupt than developed countries. Consequently, a simple question arises as to how to measure corruption so that intercountry comparisons are meaningful.

In the existing theories of corruption (see Rose-Ackerman, 1978 and Shleifer and Vishny, 1993) either per unit bribe or total revenue collected from bribes appears as a measure of corruption.[11] If per unit bribe stands as a measure of corruption, then an increase in per unit bribe increases the level of corruption. On the other hand, if total revenue collected from bribes measures corruption, then an increase in total revenue from bribes enhances corruption, even though the per unit bribe is less.

Shleifer and Vishny, (1993) illustrates the centralised and decentralised corruption by measuring per unit bribe and total revenue collected from bribes. In centralised corruption, bribe per unit is less, even though the total amount of bribe paid may be higher due to the larger supply of public goods. In contrast, in decentralised corruption, the per unit bribe is higher than in centralised corruption, but total revenue collected from bribe income is less.[12] If bribe per unit is used as a measurement criterion for corruption, then the level of corruption increases in a decentralised economy compare to that of a centralised economy. The opposite scenario occurs when total revenue collected from the bribes is the measurement criteria.

The total amount of bribes collected from corrupt transactions as a measure of corruption creates problems when it is used to compare the level of corruption between countries. For example, Bardhan (2006, p. 342) argues that, when an African country with a great deal of corruption is compared with, say, an East Asian country that is also

[11] Per unit bribe is analogous with price per unit. For example, when a corrupt bureaucrat sells a business permit, he charges a bribe along with a government price. He keeps the bribe but the price revenue stays with the government. Hence the official price is the marginal cost and the bribe is his profit per unit. On the other hand, total revenue collected from bribes is the total profit of the bureaucrat by selling the total number of permits if corrupt. For example, if a bureaucrat sells 10 permits per month at $500 bribe per permit, then the total revenue collected from the bribes is $5000, which he keeps as a profit.

[12] See Shleifer and Vishny (1993) for details.

corrupt, the actual amount of money that is transacted in the corrupt deals may be much more in the East Asian country than that in the African country. He further points out that extreme corruption may have choked off the economy in the African country so that the total amount of money collected from corrupt transactions is much smaller than in the East Asian country. Moreover, a country with a lower level of gross domestic product (GDP) seems to be more corrupt than a country with a higher level of GDP, even if the amount of money collected from corrupt transactions in both countries is actually equal. This is because the higher level of GDP brings down the ratio of total amount of money collected from bribes and GDP.

In many developing countries the occurrence of petty corruption transpires in day-to-day life (Bardhan, 2006, p. 342). For example, in India, it can be seen in any city, that traffic police officers often collect money from passing vehicles. If all the money collected by these police officers in a year is added up, it may not substantially exceed the money that was collected in one single corrupt transaction in a developed country when it buys a fighter aircraft (Bardhan, 2006, p. 342). Since the number of corrupt transactions is large, even if the amount of money collected from corrupt transactions is not so large, the developing countries may have come to be regarded as more corrupt than developed countries because developed countries do not experience many corrupt transactions in day-to-day life. The number of corrupt transactions that take place in a country may be regarded as a good measure of corruption. In this measure of corruption it is not required to trace the exact amount of money collected from each corrupt transaction or the amount of bribe collected per unit. Numbers of corrupt transactions within a country mainly describe a scenario about a country's corrupt dealings from which one can predict whether the country is more corrupt than others or not.

The difficulty in defining and measuring the levels of corruption in different countries has presented a major obstacle for the cross-country empirical research on corruption. However, more recently, researchers have begun to develop corruption indices, based on surveys; most of these are perceived corruption indices. Such assessments are also sometimes compiled by various agencies to determine country risk. The term *perception*

indices – since there are no absolute measures - contribute to cross-country assessments of the extent of corruption. Such perceived indices are based on the subjective evaluations of experts or survey respondents of how widespread or costly corruption is in particular countries. The following are some of the studies that have attempted to measure corruption:

- Business International Corporation published a number of ratings on countries, including an assessment of the level of corruption in various countries. These ratings were based on data collected from a network of correspondents and analysts around the world and were first published for the period 1981-83. Business International is now a part of the Economic Intelligence Unit. Mauro (1995) first used the data for empirical analysis.

- Political Risk Services publishes an annual report, International Country Risk Guide (ICRG) that includes corruption index. Tanzi and Davoodi (1997) have utilised this index in their empirical study.

- Transparency International - an organization devoted to fighting bribery around the world, has measured the perception of corruption in different countries. It has been publishing a corruption perception index annually since 1995. Transparency International's corruption perceptions index (CPI) has become the most widely used measure of corruption. Various studies have utilised this index in the empirical work (see, for example Sandholtz and Koetzle (2000); Treisman (2000); Fisman and Gatti (2002); Montinola and Jackman (2002); Gupta et al. (2002); Ali and Isse (2003), Chowdhury (2004); You and Khagram (2005); and Emerson (2006)).

- More recently, a rating of control of corruption has been compiled and published by a team led by Daniel Kaufmann at the World Bank. This rating by the World

Bank now publishes a new version of the indices yearly from 2003, and has biannual data from 1996 to 2002.

Mauro (1995), and Knack and Keefer (1995) first used of these indices for empirical analysis. Since then, most researchers have used a combination of these indices to estimate the relationships between corruption and a host of other variables.

2.3 The Impacts of Corruption

Until recently, there was general agreement that corruption has a detrimental effect on growth. However, theories regarding the impact of corruption on efficiency have sometimes been mutually conflicting. In addition, the current literature on the impact of corruption also indicates that the effects of corruption tend to resonate throughout an economy rather than be confined to specific corruption based transactions (e.g. Brunetti et al. 1998; Jain, 2001). Corruption has an influential effect on the level of investment, on entrepreneurial incentives and resource allocation, as well as the income distribution within a country. Thus, there is a need for understanding exactly how corruption affects these variables from different perspectives.

2.3.1 Effects on growth

The prevailing view is that corruption has adverse effects on investment and economic growth. A payment of a bribe to get an investment licence, for example, clearly reduces the incentive to invest (Bardhan, 1997, p. 1327). Corruption, particularly political or "grand" corruption, distorts the decision-making process connected with public investment projects (Tanzi and Davoodi, 1997). Corruption is likely to increase the number of projects undertaken in a country, and to change the design of these projects by enlarging their size and complexity. The net result is an increase in the share of public investment in GDP, a fall in the average productivity of that investment and (because of budgetary constraints) a possible reduction in some other categories of public spending, such as operation and maintenance, education and health. As a consequence, the rate of growth of a country decreases.

Murphy et al. (1993) point out that an increasing return in rent-seeking activities lowers the cost of further rent-seeking relative to that of productive investment. When there is slow growth, the returns to productive activity fall relative to those of rent seeking. The ensuing increase in the pace of rent-seeking activities further slows down growth. It is also argued that public rent-seeking attacks innovation, since innovators need government-supplied goods such as permits and licences more than established producers. Likewise, Bardhan (1997, p. 1327) argues that when public resources meant for building productivity-enhancing infrastructure are diverted for politicians' private consumption (for example, cement for public roads used for luxury homes), growth rates will obviously be affected adversely.

Another growth effect follows from the allocation of talent. Murphy et al. (1991, p. 503) states that "people choose occupations that offer the highest returns on their abilities when they are free to do so". Rosen (1981) claims that the ablest people choose occupations that exhibit increasing returns to their ability since the increasing returns allow "superstars" to earn extraordinary returns on their talents. When talented people become entrepreneurs, they help to improve the technology in the lines of business they pursue, and, as a result, productivity and income grow. In contrast, when they become rent-seekers, most of their private returns come from redistribution of wealth from others and not from wealth creation. As a result, talented people do not improve technological opportunities, and the economy stagnates. When rent-seeking sectors offer most able people higher returns than the productive sectors offer them income, growth can be much lower than possible. Bhagwati et al. (1984) also asserts that corruption affects the allocation of human capital because it affects the returns on rent-seeking vis-a-vis productive activities.

In their empirical analysis, Murphy et al. (1991) finds that lawyers are indeed bad and engineers are good for growth. The findings on engineers also suggest that countries that have many engineering majors also invest in human and physical capital because it increases growth. The evidence is consistent with Magee et al. (1989) study that finds that countries with more lawyers grow more slowly. In this context, Ehrlich and Lui

(1999) explain that investment in political capital (rent-seeking) consumes economic resources that could otherwise be used for production or investment in human capital. This is a source of social loss from corruption.

Some of these growth effects have been statistically substantiated from cross-country data. On the basis of the corruption ranking data assembled from the Business International correspondents in about 70 countries for the period 1980-1983, Mauro (1995), finds that there is a negative and significant association between corruption and the investment rate, and the magnitude of the effect is considerable. A one-standard-deviation increase (an improvement) in the corruption index is associated with an increase in investment rate by 2.9 percent of gross domestic product (GDP). He also finds a positive relationship between investment and institutional efficiency. A one-standard deviation increase (an improvement) in the bureaucratic efficiency index is associated with an increase in the investment rate by 4.75 percent of GDP. It might be argued that the ethnolinguistic fractionalization may affect investment not only by increasing corruption and political instability, but also via a direct channel. That is, it might slow down the diffusion of ideas and technological innovations within the country. Therefore, the finding that corruption is negatively and significantly associated with investment is consistent with the view that corruption lowers the private marginal product of capital. The finding provided some evidence in favour of the claim that corruption lowers economic growth.

Further confirming the negative relationship between corruption and investment, Mauro (1997, 1998) finds that corruption reduces expenditures on health and education. As the opportunities to extract high rents from public expenditures on education and health are relatively less, corruption distorts public expenditures away from health and education and encourages excessive infrastructure and capital intensive investment. Hence, corruption reduces the productivity of public investment and the country's infrastructure, which, in turn, has a damaging impact on the country's economic growth. Gupta et al. (2001) confirms that corruption is associated with higher military spending

as a share of both gross domestic product and total government spending, as well as with arms procurement in relation to GDP and total government spending.

Wei (1997a, 1997) analyses the adverse effects of corruption on foreign direct investment (FDI) and finds that corruption, acting like a tax, reduces foreign direct investment. He concludes that the less predictable the level of corruption, the greater is its impact on FDI, as higher variability discourages foreign direct investment by increasing risk and uncertainty. In an empirical study on the consequence of corruption, Rahman et al. (2000) finds that corruption reduces growth by driving away foreign direct investment, a source of capital that is especially important for developing countries with limited capacity for developing technologies and knowledge.

Rivera-Batiz (2001) examines the effect of capital account liberalisation on the long-run growth of a developing economy. In a general-equilibrium model, this study shows that a drop in growth occurs when the level of corruption is high enough to cause domestic rates of return to capital before liberalization to drop below those in the rest of the world. In this case, liberalization generates capital outflows, which act as a constraining force on innovation, reducing the rate of technological change and lowering output growth.

In another study, Mo (2001) introduces a new perspective on the role of corruption in economic growth and provides quantitative estimates of the impact of corruption on growth and the importance of the transmission channels. He finds that a 1 percent increase in the corruption level reduces growth rate by about 0.72 percent. The most important channel through which corruption affects economic growth is political instability which accounts for 53 percent of the overall effect. The other channels include the level of human capital and the share of private investment. Corruption is most prevalent where other forms of institutional inefficiency, such as bureaucratic red tape and weak legislative and judicial systems, are present.

The extent of corruption on the effects of growth processes is quite ambiguous. Although the requisite time series evident in terms of data is hard to get, circumstantial evidence suggests that over the last 100 years or so corruption has generally declined with economic growth in most rich countries (Bardhan, 1997). This result gives greater recognition that corruption can have a seriously adverse impact on development, and has been a cause for concern among developing countries. In a recent survey of 150 high level officials from 60 Third World countries the respondents ranked public sector corruption as the most severe obstacle confronting their development process (Kaufmann, 1998).

Yet, it can be said that the process of economic growth ultimately generates enough wealth to reduce corruption. Rewards to entrepreneurship and productive investment, relative to rent-seeking activities, rise when there is sustained growth. A prospering economy can also afford to pay its civil servants well, reducing their motivation for corruption. To some extent, prosperity in the long run, at least requires democratic reform to check corruption. This is because democratic institutions build mechanisms of accountability and transparency at different levels which make it difficult for the networks of corruption to be sustained for long.

2.3.2 Effects on efficiency

Certain claims based on everyday experience about corruption in developing countries are often heard as follows: bribery and corruption can have positive effects; corruption is endemic everywhere; the cost of addressing corruption are prohibitively high, for example. This debate may have engendered greater attention and research on corruption. The answers to the questions posed are complex. First, the academic world has a penchant for description and explanation, rather than prescription and policy relevance. Second, the necessary data are not usually available. Researchers find it difficult to study corruption empirically because the parties involved have every reason to keep data hidden and governments are reluctant to allow foreigners, or even their own citizens, to work on such sensitive issues. Consequently, the academic debates over the tonic and toxic properties of corruption tend to rely too much upon anecdotes, hypothetical

scenarios and speculative linkages between corruption and future social outcomes (Klitgaard, 1988). In such circumstances, debates are likely to remain inconclusive.

In the existing literature, the debate on the effect of corruption on efficiency is based on two opposing strands (see Leff, 1964; Rose-Ackerman, 1978). The efficiency-enhancing strand views corruption as increasing efficiency because corruption 'greases the wheels'. The opposing strand, labeled as efficiency-reducing, views corruption as having a damaging impact on efficiency because those 'rusty wheels' are put there in the first place to attract bribes.

The studies by Leff (1964) and Huntington (1968) the efficiency-enhancing school of thought suggests that, in the context of pervasive and cumbersome regulations in the developing countries, corruption may actually improve efficiency and help growth. As pointed out by Bardhan (1997, p. 1322), the efficiency-improving argument of corruption is an extension of the idea of second-best principle. In a second best-world, there are pre-existing policy-induced distortions in the form of black marketing, smuggling, etc. which may actually improve welfare even when some resources have to be spent in such activities. The efficiency-enhancing school has argued that corrupt payments introduce a kind of market mechanism. In a system where goods and services are allocated by queue, politics, random selection, or merit, corruption may instead allocate goods according to willingness and ability to pay. Corruption may thereby put goods and services in the hands of people who value them most effectively (Leff, 1964). In a sense, then, after the corrupt action, those goods and services are more "efficiently" allocated in the economic sense.

Two aspects of corrupt actions can be seen as, first, a prediction, i.e. market forces are hard to avoid. When the market is not used to distribute goods and services, corruption will creep in as a kind of illicit substitute. Second, it is an evaluation, i.e. when corruption does occur it may lead to an allocation of goods according to the willingness and ability to pay. This development, in turn, may be economically efficient, therefore, perhaps, socially useful. However, this argument is more complex when a briber does

not have full information about the cost levels, and therefore the bribing capacity of his competitors, and also when he has to take into account strategic considerations in making any particular offer of a bribe (Bardhan, 1997). In such a context, Beck and Maher (1986) and Lien (1986) have shown in their model that, under certain assumptions, the lowest cost firm is always the winner of the contract, and thus bribery can reproduce the efficiency consequences of competitive bidding producers even under imperfect information.

Another efficiency argument in favour of corruption is that it acts as “speed money” which reduces administrative delay in moving files and getting ahead in slow-moving queues for public services (Huntington, 1968). Therefore, corruption can also be efficiency-enhancing if the economy suffers from excessive bureaucratic red-tape (Barreto, 2000). In this context, queuing models have received some attention in the literature of corruption, which allows the possibility for the corrupt bureaucrat to practise price discrimination among clients with different time preferences. In an interesting queuing model Lui (1985) shows that, if prizes are awarded simultaneously at a specified time to the first customer who queues for them, the arrival times of the customers to the queue can serve the function of prices in the allocation process. When prizes are awarded in a continuous stream as is common in practice, the arrival times cannot serve this function very well. Instead, bribes for buying better positions in the queue sometimes give useful signals similar to those of a pricing mechanism.

The bribery may have beneficial effects. It is often argued that bribes serve as “lubricants” in an otherwise sluggish economy and improve its efficiency. This model has explained that under some specified conditions, it is capable of giving socially optimal solutions, and in this non-cooperative game, attainment of a Nash equilibrium minimizes the average value of time-costs of the queue (Lui, 1985). However, in this optimal allocation, the amounts of bribe payments are not decided by the server, but by the customers themselves. Customers can decide to pay bribes for buying better positions in the queue. Based on this equilibrium, the server who wants to maximize either bribe revenue or bribe revenue net of costs of service will also choose an optimal

speed of service. It has been shown that the server could choose to speed up the service when bribery is allowed. The model can also be useful in designing the schedules of incentive payments in the pay structure of civil servants.

As for the “speed money”, Myrdal (1968) has argued that corrupt officials may, instead of speeding up, actually cause administrative delays in order to attract more bribes. According to the political economist Rose-Ackerman (1978), even a legal price system, cannot realistically be used to produce efficiency if all applicants are obliged to line up in a single queue. A corrupt price system adds further sources of inefficiency: distortions due to fear of penalties, monopolistic officials not making efficient choices, and the possibility that officials may slow down their pace of work to extract bigger bribes. Rose-Ackerman also concluded that those economists who look favorably upon corruption generally have a limited point of view, a narrow definition of goodness and an oversimplified model of the corrupt market place.

Shleifer and Vishny (1993, pp. 604-7) have shown that, in general, centralised corruption has less adverse effects for efficiency than decentralised bribe-taking because, in the former case, the bribee will internalise some of the distortionary effects of corruption. They illustrate this point with an elementary model comparing a case of independent monopolists (where different government agencies provide complementary public goods or services independently) with that of a joint monopolist agency providing the same goods and services. Suppose a customer needs two permits or two complementary inputs from two different agencies in the former case. Each agency as an independent monopolist will take the other agency’s sales as given and so the bureaucrat in charge of it will set the bribe-inclusive price in such a way that marginal revenue is equal to the marginal cost, the bribe per unit of sale being the difference between the price and the monopolist’s marginal costs (i.e., the official price of the good supplied). The joint monopolist on the other hand, takes into account the effect of an extra unit sold on the sales of the complementary good and thus on the revenue of bribes from other sources as well, so that, in equilibrium, the marginal revenue in the supply of each good is less than the marginal cost. Thus, per unit bribe is higher and the supply of each good

lower in the independent monopolist case than in the case of collusion. Of course, the aggregate revenue from the bribe is larger in the case of joint monopoly, but the customer gets a larger supply of both inputs.

Decentralisation increases inefficiency flowing from corruption in post-Communist Russia in comparison with Communist Russia in these terms. A good illustration of this problem described in Shleifer and Vishny (1993, p. 615), is foreign investment in post-Communist Russia. To invest in a Russian company, a foreigner must bribe every agency involved in foreign investment, including the foreign investment office, the relevant industrial ministry, the finance ministry, the executive branch of the local government, the legislative branch, the central bank, the state property bureau, and so on. The obvious result is that foreigners do not invest in Russia.

Goorha (2000) analyzes several corruption activities, especially with reference to economies in transition. Following the economic model developed by Shleifer and Vishny (1993), he tries to find out the economic reasons behind the rise of corruption and criminal operations like the Russian Mafia in the post-communist Russia. Comparing different types of corruption structures, it is suggested that, during transition, the corruption structure in the economy changes from a more centralized joint monopoly to a decentralized corruption structure causing a rise in corruption as well as inefficiency.

The idea of differential efficiency effects of centralised versus decentralised corruption may explain why corruption is much more distortionary than taxation. It can also be argued that even centralized corruption is more distortionary than taxation. This is because of the distortions entailed by the necessary secrecy of corruption. According to Shleifer and Vishny (1993), efforts to avoid detection and punishment cause corruption to be more distortionary than taxation. On some goods taking bribes without being detected is much easier than on others. Government officials will then use their powers to induce substitution into the goods on which bribes can be more easily collected without detection. As a result, there is a shift in a country's investments away from the

highest value projects, such as health and education, into lower value projects, such as defence and infrastructure. To preserve the secrecy of deals, a small elite group may also try to raise entry barriers for outsiders, which, in many situations, has the effect of discouraging the flow of new ideas and innovations.

Interestingly enough, Mauro (1995), Kaufmann (1997) and Tanzi (1997) do not find any empirical support for the "speed money" argument which states that corruption can get bureaucrats to work faster in the presence of a slow bureaucracy. Ades and Di Tella (1997 p. 501) fail to uncover any benefits associated with corruption in countries bogged down in red tape and conclude that corruption acts mainly as 'sand-in-the machine'. In addition, Kaufmann and Wei (2000) show that there is a positive relationship between the effective red-tape and bribery in a country. Firms that paid more in bribes also spent more, not less, management time with bureaucrats in negotiating regulations. If the 'grease-the-wheels' argument was valid, higher levels of bribery would be associated with higher levels of bureaucratic efficiency requiring less managerial effort.

2.3.3 Effects on distribution

Corrupt behaviour by itself need not impose a net social cost since it involves transfer payment from bribe-payers to bureaucrats (Ehrlich and Lui, 1999). Moreover, bribes can ameliorate the deadweight cost of government intervention by directing resources toward higher bidders (Leff 1964; Lui 1985). Thus, corruption implies some degree of income redistribution. Myint (2000) argues that, under a corrupt system, the privileged and the well-connected enjoy economic rent. Economic rent, by definition, represents abnormal or monopoly profits, and can bestow large benefits. As such, there is a tendency for wealth to be concentrated in the hands of a tiny minority of the population. Income distribution, therefore, becomes highly uneven. He further added that the burden of corruption falls more heavily on the poor as they cannot afford to pay the required bribes to send their children to a decent school, to obtain proper health care, or to have adequate access to government provided services. Bates (1981) argues that in the case of food pricing in Africa, beneficiaries are the relatively rich and politically active city dwellers, and the losers are the poor and politically inactive farmers.

Mo (2000) has explained that corruption favors a particular class of people and creates inequality in opportunities. Higher income inequality results in stronger incentives for the groups at the bottom of the distribution to engage in illegal or violent actions for material benefits or as a reaction to inequality. This instability creates uncertainty over the protection of property rights and, hence, reduces investment and productivity. Consequently, unequal income distribution has a negative impact on economic growth (Alesina and Perotti, 1996; Mo, 2000).

Studies of the distributional consequences of corruption by Gupta et al. (2002) find that corruption increases income inequality and poverty through lower economic growth; biased tax systems favoring the rich and well-connected; poor targeting of social programs; use of wealth by the well-to-do to lobby government for favourable policies that perpetuate inequality in asset ownership; lower social spending; unequal access to education, and a higher risk in investment decisions of the poor. In a cross-country regression analysis for the period 1980-97 show that high and rising corruption increases income inequality and poverty through the above channels. The impact of corruption on income inequality and poverty is considerable. A one-standard deviation increase in the growth rate of corruption reduces income growth of the poor by 7.8 percentage points a year (Gupta et al., 2002).

On the other hand, Li et al. (2000) study corruption and how it affects income distribution find that corruption affects the Gini coefficient in an inverted U-shaped way; that is, inequality is low when levels of corruption are high or low, but inequality is high when corruption is intermediate. Contrary to these, You and Khagram (2005) confirms that increased inequality can lead to higher corruption. Using an instrumental variable approach on a sample of 125 countries and controlling for several factors such as democracy, legal origins and endogeneity issues, the study finds strong links showing that income inequality increases the level of corruption. Dutta and Mishra (2005) show that wealth inequality may itself act as a catalyst for corruption, and wealth-constrained individuals continue to be adversely affected by corruption through market outcome. Academic literature is less definite about how corruption influences distributional

inequality, but it is obvious that corruption has its impact on income distribution because a bribe in corruption literature is nothing but a transfer of resources, usually from the less well-off to the wealthier.

2.4 Factors Behind Different Incidence of Corruption

We now turn to the question of why the incidence of corruption is more widespread and persistent in some countries than in others. Numerous explanations have been suggested for the various incidence of corruption in different countries. These explanations can be classified into three broad categories: socio-economic, political and economic which are discussed in the next sub-sections.

2.4.1 Socio-economic factors and corruption

In describing the various socio-economic factors that cause corruption across many countries, several studies argue that economic development, education and income inequality are particularly the main factors that affect certain levels of corrupt activities. There is a strong correlation between economic development and corruption. Prevalent corruption should be negatively linked to the level of the economic development of a country (Treisman, 2000; Graeff and Mehlkop, 2003). In other words, rich countries are perceived to be less corrupt than poor nations. To explain the relationship between economic development and corruption most studies use gross domestic product (GDP) per capita to reflect the level of economic development (see for example, Treisman, 2000; Graeff and Mehlkop, 2003; Goel and Nelson, 2005).

Education also has an important effect on corruption. In poor countries with high levels of illiteracy, many people have little understanding of governmental operation (Rose-Ackerman, 1999). For such people, it is often also not clear as to what they should expect from a legitimate government (Graeff and Mehlkop, 2003). In such a situation, corruption is more likely because people suppose that they ought to present gift as gratitude for favourable decisions (Pasuk and Sungsidh, 1994). Ahrend (2002) investigates the relationship between corruption, human capital and the monitoring capacities of the civil society. In a theoretical model the study finds that the impact of

education on corruption to depend on the capacities of the civil society to oversee government officials. If those capacities are well developed, education decreases corruption, whereas it may lead to higher corruption if the civil monitoring is low. Mauro (1998) finds that countries classified as being highly corrupt under invest in education and neglect the creation of human capital.

Inequality of income distribution also considers as a possible determinant of corruption. High income inequality may correspond to perceptions of unfair state operations and foster feelings of injustice which could make the incidence of corruption more likely (Smelser, 1971). You and Khagram (2005) argue that the rich are likely to both have greater motivation and opportunities to engage in bribery and fraud as one means to preserve and advance their status, privileges, and interests while the poor are more vulnerable to extortion at higher levels of inequality. Studies utilise Gini coefficient as a proxy for income inequality (Graeff and Mehlkop, 2003; You and Khagram, 2005) to measure its effect on corruption. Several empirical studies consider these factors to explain the variations in corruption across nations.

2.4.2 Democracy and corruption

Political explanations of corruption mainly emphasise democratisation and decentralisation. The degree of political freedom can have an important effect on the level of corruption because political competition, theoretically, is supposed to provide checks against corruption (Rose-Ackerman, 1999). Greater transparency due to a free press and freedom of political associations might lead to reduce corruption because the free press is able to expose graft and political associations are able to take corrupt governments out of power (Rose-Ackerman, 1999; Shleifer and Vishny, 1993). In this context, Robinson (1998, p. 2) argues that the creation of democratic institutions offer the potential for closer scrutiny of the actions of politicians and government officials by the citizen, an independent media and elected representatives, which in turn reduces the level of corruption.

The pluralist approach assumes that political initiatives centered on the creation of new democratic institutions such as elected legislature, parliamentary committees and watchdog bodies are central to the success of efforts to control corruption (Robinson, 1998 p. 9). Little (1996) points out that the political reforms are thought to contribute towards an environment which is more conducive to deter corruption because they can increase the responsiveness of political elites to the will of the people. However, the opinion is divided. Rose-Ackerman (1999) argues that elections increase the accountability of politicians, but it also produces new incentives for corruption because political financing needs to increase with electoral competition. Other studies argue that corruption is on the increase as a direct result of democratisation, since democratic political systems provide incentives and opportunities for corrupt practices. Robinson (2003, p. 2) notes that while political competition offers opportunities for political leaders to gain legitimacy by taking action against corruption, it can also enable such elites to secure greater access to existing rent seeking. Johnston (1996) suggests that democratic rights and processes do not make a significant contribution to reduce corruption. In reality many new democratic nations in Africa, Eastern Europe and Latin America are characterised by high and increasing levels of corruption, and the democratic structures of these nations have proved to be markedly ineffective in curbing the spread and tenacity of corrupt practices in developing countries (Harriss-White and White, 1996; Little and Posada-Carbo, 1996).

Rock (2007, p. 1) argues that in newly democratising countries, corruption rises at least initially, before falling as democracies become consolidated, yielding an inverted U pattern. In a theoretical model Mohtadi and Roe (2003) explain that young democracies suffering from insufficient checks and balances and lack of transparency, provide rent seekers with greater access to public officials and hence greater opportunities for collecting rents, at least up to a point. Because of free entry into rent seeking, competition among rent-seekers ultimately reduces the returns to individual rent seekers although it drives aggregate rents up. But as the institutions developed transparency and the accountability in new democracies rise, aggregate rents and corrupt activity fall because rents per rent seeker fall as the cost of rent seeking due to increase in the

probability of getting caught and punished rises. The empirical evidence on the relationship between democracy and corruption also provide some mixed results which is discussed in section 2.5.

2.4.3 Economic freedom and corruption

Liberal economists argue that it is the regulatory state with its elaborate system of permits and licenses that spawns corruption. And different countries with different degrees of insertion of the regulatory state in the economy give rise to varying amounts of corruption (Bardhan, 1997, p. 1330). However, the effects of economic freedom and corruption have been debated by economists and political scientists for many years. Leff (1964) and Huntington (1968) argue that in a non-market situation bribes sometimes can partially restore the price mechanism and improve allocative efficiency. Lui (1996, p. 26) argues that corruption cannot exist if the resource allocation system is perfectly competitive. He further points out that when an official has the authority to allocate a public good below the market equilibrium price, then it creates a possibility of rent seeking and the official may take the opportunity to accept bribes. On the other hand, if price of the good is already at the equilibrium level, corruption will not take place. Thus, deviation from the competitive market caused by government intervention is a major cause of corruption. In this context, Bliss and Di Tella (1997) note that bribes cannot occur in markets in which perfect competition prevails because there are no excess profits in perfect competition from which to pay the bribes.

Myrdal (1968, Chapter 20) points out that many less developed countries have very high levels of corruption. Also, corruption is widespread in centrally planned economies, such as the former Soviet Union and China (see, for example, Simis, 1982; Yu, 1993). A common feature for these countries is that their market mechanisms are heavily distorted (Lui, 1996). Within a country, corruption is most common in the government-controlled activities where resource allocations are not guided by the market forces. Since non-market resource allocation is present in every country, corruption is pervasive throughout the world.

In examining the relationship between economic freedom and corruption Graeff and Mehlkop (2003, p. 606) explain that an imposition of restrictions on free trade via taxes and licences creates the opportunity for public officials to take bribe or to engage in similar activities. To avoid those restrictions, some people will be willing to pay a bribe to the officials for the supply of public goods they demand. Similarly, corruption can develop when obstructions to economic freedom are imposed (Rose Ackerman, 1999). Thus, economic liberalisation has the potential to reduce corruption (Robinson, 1998, p. 3). The replacement of discretionary controls over prices and the production and distribution of public goods and services with market mechanisms should limit the scope for rent seeking behavior by the public officials.

Economic reforms can also have adverse effects on corruption at least in the short run (Robinson, 1998, p. 8). This is noted as economic liberalisation in the absence of effective regulation has the potential to generate high levels of economic rent that can increase incentives for corrupt practices. The experience from developing countries, which have undergone economic liberalization, does not provide enough evidence to the belief that the market can reduce the incidence of corruption (Robinson, 1998; Harriss-White and White, 1996). Graeff and Mehlkop (2003) point out that not all aspects of economic freedom are deterrents to corruption. Their empirical finding suggests that there are regulations which decrease corruption by increasing the transaction costs of corruption. Mauro (1997) in his empirical study finds that public corruption can be traced to government intervention in the economy. A country has more corruption where government regulations are pervasive. This finding is no doubt valid to a large extent, but cannot explain the rise of corruption and criminal operations in the post communist Russia and why privatisation tends to increase the level of corruption in the economy in China. The next section presents a detail description on the empirical evidence on the causes of corruption.

2.5 Empirical Evidence on the Causes of Corruption

The existing literature provides few, and diverse, empirical studies about the causes of corruption. Empirical studies can be analysed from three different angles: level of economic development, level of democracy and level of economic freedom.

First, by far the strongest and most consistent finding of the empirical work on corruption is that lower perceived corruption correlates closely with higher economic development (La Porta et al. 1998; Ades and Di Tella, 1999; Treisman 2000 and Sanholtz and Kotzle, 2000). For example, Treisman (2007) points out that the correlation coefficient between the natural log of per capita GDP at purchasing power parity in 2005 and the 2005 Transparency International's corruption perception index is 0.79, and the correlation coefficient with the World Bank control of corruption index is 0.81. Treisman (2000; 2007) studies find extremely robust relationships between economic development and corruption. The negative relationship between economic development and corruption survives even after the inclusion of a variety of control variables (for example, ethno-linguistic fractionalisation, latitude, region, religion, culture, democracy, trade, inequality, inflation and various policy variables), and the relation is found to exist in each region of the world.

Second, a number of studies have explored the effect of democratic institutions on the level of corruption. Some have argued that democracy's effects are gradual, and so a long experience of popular government is necessary to lower the level of corruption. In other words, the current level of democracy is not an important determinant; long exposure to democracy affects the level of corruption. Similarly, other studies have suggested a nonlinear relationship between democracy and corruption. Democratisation may increase corruption in the short run, but reduces corruption as democracy deepens.

The empirical findings on the effect of democracy in controlling corruption show an ambiguous result. Ades and Di Tella (1999) note that political rights have no influence on corruption. However, simply regressing perceived corruption indexes on Freedom House political rights scores, Treisman (2007) finds that greater political rights are

significantly related to lower perceived corruption in the World Bank control of corruption ratings. The results are somewhat less significant using Transparency International's corruption perception index. Again, the results are not always statistically significant using the World Bank data if the Polity IV democracy rating is substituted for the Freedom House score. On the other hand, Goel and Nelson (2005) find that corruption declines with the degree of civil liberties associated with democracy.

Montinola and Jackman (2002) and Rock (2007) note a nonlinear relationship between democracy and the level of corruption. On the other hand, Treisman (2000) suggests that it may take decades for democratic institutions to translate into lower levels of perceived corruption. Brunetti and Weder (2003) argue that freedom of the press is particularly important for exposing corrupt officials and deterring the misuse of public offices. They regress several perceived corruption indicators on an index of press freedom constructed by Freedom House, and get statistically significant results.

Third, Ades and Di Tella (1999) argue that corruption tends to be greater where there are larger economic rents available for bureaucrats to capture. They hypothesise that where an economy is more oriented toward natural resources, rents and corruption will be higher. At the same time, openness to international trade will intensify market competition and reduce the monopoly power of domestic producers, shrinking the profits available for corrupt officials to extract. They present evidence that the share of imports in GDP and the share of fuels and minerals in exports are both significantly related to perceived corruption. Treisman (2000) finds that the share of imports in GDP is associated with lower corruption. Sandholtz and Koetzle (2000), Sadholtz and Gray (2003) and Garring and Thacker (2005) also find a negative relationship between trade openness and corruption.

Efforts have been made to ascertain the various causes of corruption, however studies did not produce any consistent results. For example, more corruption may cause a high level of red tape, but the data does not allow concluding that regulatory interventionism leads to higher perceived corruption or that perceived corruption could be reduced

merely by limiting regulatory intervention. In addition, various studies have used data from different sources making it difficult for empirical studies to come to a general conclusion about the causes of corruption. The aim of this study is to contribute to the understanding of corruption by identifying the determinants of corruption and by analyzing the extent to which these economic and political factors explain the differences in corruption across countries. When the determinants of corruption are clearly identified, the appropriate policy conclusions can then be drawn from the analysis, and the policy makers can then design and implement measures to curb and control its harmful effects.

2.6 Summary

This chapter has surveyed theoretical and empirical aspects of the impacts and causes of corruption. This survey has also focused on the concept of corruption and the impacts of corruption from the dynamic and static points of view. It has examined the empirical studies to estimate the causes of corruption from different perspectives.

Empirical evidence on the causes of corruption has been mainly produced from cross-country analyses. Published studies found mixed evidence regarding the effect of institutional factors on the level of corruption. Most of the empirical studies confirm the detrimental effects of corruption on growth. Indeed, many studies conclude that economic development is an important factor in combating corruption, however, studies have not examined why some countries corruption level increases even with a rise in income.

Although a negative effect of corruption on economic development has been found, however the role of democracy and its impact on corruption remains ambiguous. In fact, some studies on the role of democracy demonstrate that democracy has no effect in controlling corruption while other studies find some negative relationship between democracy and corruption. Moreover, the interactive effects between democracy and economic freedom and its effects on corruption remain unexamined. The interaction effect is important because there are countries in the world where there exists a low level

of democracy, high level of economic freedom and a low level of corruption (for example Hong Kong and Singapore). In contrast, in a country like India, there is a high level of corruption along with a high level of democracy and low level of economic freedom.

To clarify the debate of the relationship between democracy and corruption and to examine the interaction effect of democracy and economic freedom in controlling corruption this study focuses on the role of economic development and the nexus between democracy and economic freedom. The study investigates the issue of economic development and corruption based on classification of countries by income and regions. In addition, to explain why corruption level increases with a rise in income this study examines the relationship between income and corruption in a nonlinear framework.

The issue of democracy-corruption nexus will be examined by considering various dimensions of democracy as an aggregate variable, as well as separately to find out which dimension(s) of democracy is more crucial in combating corruption. The study takes into consideration the measurement issue of democracy indicators and their different methods of construction. The study will examine a postulated non-linear relationship between democracy and corruption to confirm the findings of earlier research. Freedom House political rights, civil liberties and press freedom variables will be utilised in examining the effect of democracy on corruption. Other sources of democracy indices will also be used to confirm the results. The study utilises Transparency International's corruption perception indexes for the empirical investigation. In the absence of hard evidence on corruption raises some issues about the reliability of using the perception-based indices which requires a deeper analysis of the indices. The next chapter examines the corruption perception index in detail.

CHAPTER 3

Corruption Perception Index: A Deeper Insight

3.1 Introduction

Corruption is considered to be an important bottleneck for economic development. However, the empirical research on corruption is much rarer due to the difficulty in measuring relative corruption across countries (Treisman, 2000). Moreover, the secret nature of corruption makes it difficult to obtain hard data of the actual levels of corruption (Svensson, 2005). The actual data on corruption to a large extent depends on the effectiveness and capacity of a country's judiciary system in prosecuting corruption (Lambsdorff, 2000).[13] The objective data of corruption mostly reflects the success of anti-corruption initiatives rather than the actual levels of corruption. In the past decade several international organisations, i.e. business risk analysts and polling organisations, have been measuring the level of corruption based on various perceptions. The perceived corruption indices are constructed on the basis of survey responses of business people, academics and local residents.[14] Studies have utilised perception-based indices as a quantitative measure of corruption, amongst this Transparency International's (TI's) corruption perception index (CPI) is the most widely used measure.[15] This chapter examines TI's subjective indices of corruption perceptions by categorising countries into most-corrupt, medium-corrupt and mostly-clean groups.

The CPI ranks countries in terms of the degree to which corruption is perceived to exist amongst public officials and politicians. An important feature of TI's CPI is that it

[13] The crime prevention and criminal justice division of the United Nations Office in Vienna assembles hard data of corruption (United Nations, 1999).
[14] Treisman (2000) notes that subjective indices are highly correlated with each other and highly correlated over time.
[15] The perceived corruption indices increase the scope of empirical research, for examples see Sandholtz and Koetzle (2000); Fisman and Gatti (2002); Treisman (2000); Montinola and Jackman (2002); Gupta et al. (2002); Ali and Isse (2003), Chowdhury (2004); You and Khagram (2005); and Emerson (2006).

provides the variance/standard deviation of the rankings of possible values of CPI score. This measures the degree of consensus of various surveys that provides an opportunity to verify if consensus evolves over time. As the standard deviation values of CPI rankings give an insight into the perceptions of corruption it deserves a deeper look, and to the best of the knowledge has not been examined before.

The analysis of CPI scores and the standard deviation of CPI rankings in this chapter assess two key hypotheses of the perceptions of corruption. First, CPI scores are evaluated to see how it changes over time, i.e. is there any trend of increase or decrease in corruption across countries? By estimating the standard deviation of the CPI scores we test if the CPI scores for the listed countries evolve over time. Second, it is examined that whether the CPI score, which is subjective in nature, converge towards a perfect concordance over time, i.e. does the degree of disagreement among the polls decline over time? In this case the standard deviations of CPI rankings are used to examine whether a country's score as reported by TI, conveys the reliability of using CPI as a quantitative measure of corruption.

The chapter is outlined as follows. The next section discusses the conceptualisation of CPI and the framework of standard deviation of the rankings of CPI scores. Using statistical and econometric measures for the period 1995 to 2006, the study reports the results of persistency or volatility of CPI and the convergence of perceived level of corruption over time in section 3.3. The final section presents the conclusion.

3.2 CPI and It's Standard Deviation of Rankings

The TI's CPI score is a composite index taking into consideration the poll of polls that reflects the perceptions of business people, academics, country analysts and the general public, including both resident and non-resident groups[16]. The 1995 CPI score for each country had a minimum of two sources which has since increased to have a minimum

[16] For the methodology of construction of CPI scores please see http://www.transparency.org.

source of three and up to 18 sources for greater reliability.[17] A brief overview of the construction of CPI and the standard deviation of the rankings of CPI highlights the key questions to be examined in this study.

3.2.1 Corruption perception index

The CPI scores have been developed into a leading indicator of the incidence of corruption. The TI's first CPI value in 1995 ranked the level of corruption for 41 countries and in 2006 its ranking extended to 163 nations. It scores countries on a scale ranging from 0 to 10. A country with a score 0 indicates a high level of perceived corruption where the business transactions are entirely dominated by bribery, kickbacks and extortion; while a CPI score of 10 is that of an entirely clean country. The CPI of each year combines assessments from the past two years to reduce abrupt variations in scoring. Also, the high correlation between the sources reduces the differences in the variations of sources.

The comparison of CPI values of a country for the period 1995 to 2006 depicts the changes in perception of corruption over time although there have been some methodological changes in the construction of the index.[18] For the purpose of this study, we divide the corruption perceptions index into three groups highlighting the most-corrupt (MCOR), medium-corrupt (MEDCOR) and mostly-clean (MCLEAN) countries. Accordingly, the CPI scores range from 0 to 3.33 for the MCOR (Group 1) countries, the MEDCOR (Group 2) countries ranging from 3.34 to 6.66, and the Group 3 consists of MCLEAN countries with the CPI score greater than 6.66 to 10.[19] Based on the classification we estimate the standard deviation of CPI scores to evaluate if there is any

[17] TI's minimum number of sources provides a sufficient robustness for that country to be ranked in the CPI.

[18] The impact of methodological changes is rather small because construction of CPI involves weighting, aggregation and standardization of data from different sources before determining each country's mean score. This minimizes the effect of the adjusted value of a particular source after methodological modifications. This also applies to inclusion or exclusion of particular source(s) and its impact on the mean score.

[19] As CPI ranges from 0-10, we divided the range i.e., 11 by 3 to make the class limit of 3.33 to differentiate countries with three different levels of corruption as most-corrupt, medium-corrupt and most clean countries.

trend for improvement or deterioration in the perceptions of corruption over time for each group of countries.

3.2.2 Standard deviation of the CPI rankings

The standard deviation values of the ranking of CPI, reported by TI are based on the highest and the lowest value of corruption perception scores for each country assessed by various sources.[20] The standard deviation values of the ranking reflect any disagreement in the degree of corruption from various surveys used for constructing the CPI. The higher the standard deviation value the greater is the difference in the perceptions about a country amongst various sources. A high standard deviation value in Belarus in 2003, for example, indicates a wide disparity between the polls. In contrast, a lower standard deviation value for Singapore expresses a near universal agreement of various polls. The diverging perceptions may be due to different interpretation of corrupt activities and to different experiences in these two countries. It can also be due to the objective difficulties in assessing the right score.

In the countries where some institutions still resist corruption, while others are openly engaging in illegitimate practices, an assessment obviously faces practical difficulties. Thus, a high standard deviation value may, in this respect, also represent a heterogeneous state of affairs (Transparency International, 1997). However, a lower value of standard deviation between the sources suggests more consensus and a reliable

[20] TI used following sources in the period 1995 to 2006: World Competitive Report, Institute for Management Development (Lausanne); Political and Economic Risk Consultancy (Hong Kong); Business International (New York); Impulse Peter Neumann, DRI/McGraw-Hill Global Risk Service; Political Risk Services (East Syracuse, NY); Internet Corruption Ranking, Göttingen University; Gallup International, Economist Intelligence Unit (Country Risk Service and Country Forecasts); Political and Economic Risk Consultancy (Asian Intelligence Issue), Political Risk Services (International Country Risk Guide); World Development Report (World Bank); World Economic Forum and Harvard Institute for International Development (Global Competitiveness Survey), Wall Street Journal, Central European Economic Review; Freedom House; World Bank/Basel University; International Working Group, International Crime Victim Survey; World Bank and EBRD, Business Environment and Enterprise Survey; World Economic Forum, Africa Competitiveness Report, PricewaterhouseCoopers; World Business Environment Survey (World Bank); State Capacity Survey (Columbia University); Informational International, Survey of Middle Eastern Businesspeople; World Markets Research Centre, Risk Ratings; Multilateral Development Bank Survey, Merchant International Group, Grey Area Dynamics; Country Policy and Institutional Assessment (World Bank); United Nations Economic Commission for Africa.

CPI score for a country. In other words, most of the sources place the country at the same level on the overall scale. Given these aspects of the CPI it is of importance to examine its variability and convergence over time.

3.3 Empirical Analysis

This section presents the results for examining two key hypotheses based on the CPI scores and the standard deviation of ranking of CPI scores. The first hypothesis evaluates the trend of CPI scores across countries over time. Second, in examining the reliability of using CPI scores we test whether the opinion polls to construct the CPI scores of the countries converge towards general agreement over time? The empirical methodology for examining the first hypothesis involves estimating the standard deviations of CPI scores followed by the first order auto regression for the period 1995 to 2006. For the analysis of general agreement of the opinion polls of various sources the best fitted kernel curves and boxplots diagrams are utilised.

3.3.1. Empirical results for the CPI scores

The estimated results for the trend of CPI scores for three classified groups, i.e. most-corrupt, medium-corrupt and mostly-clean countries are presented in Table 3.1.[21] A high CPI standard deviation value of a country means a larger change in perception of corruption for that country, whereas a low standard deviation value represents a relatively stable perception of corruption over time. Countries with the estimated standard deviation of CPI scores in Table 3.1, arranged from the lowest standard deviation to the highest standard deviation of CPI scores in each group, reflect the variability in CPI scores from stable perceptions to a more volatile perceptions index.

[21] As the CPI scores for some countries are not available for the full period, the estimation of the standard deviation of CPI scores is based on the available periods of these countries.

Table 3.1 Estimated standard deviation values of CPI scores over 1995-2006

Group 1 (MCOR)	**SD of CPI - Group 1**	**Group 1 (cont.)**	**SD of CPI – Group 1**	**Group 2** (MEDCOR)	**SD of CPI – Group 2**	**Group 3** (MCLEAN)	**SD of CPI – Group 3**
Congo, DR	0.06	Mexico	0.28	Malaysia	0.16	New Zealand	0.11
Congo, Rep.	0.06	Thailand	0.28	Bahrain	0.17	United States of America	0.14
Kyrgyzstan	0.07	Uganda	0.28	Malta	0.20	Netherlands	0.15
Albania	0.10	Ecuador	0.29	Tunisia	0.21	Australia	0.16
Niger	0.10	Haiti	0.29	Jamaica	0.22	United Kingdom	0.16
Sierra Leone	0.10	Serbia & Mont.	0.29	Botswana	0.23	Norway	0.18
Mongolia	0.12	Panama	0.30	Lithuania	0.26	Sweden	0.18
Vietnam	0.12	Guatemala	0.33	Seychelles	0.28	Iceland	0.21
Iran	0.13	Cameroon	0.34	Cyprus	0.29	Switzerland	0.24
Myanmar	0.13	Georgia	0.34	El Salvador	0.29	Singapore	0.24
Sudan	0.13	Indonesia	0.34	Turkey	0.30	Denmark	0.25
Yemen	0.13	Uzbekistan	0.34	Kuwait	0.31	Finland	0.28
Iraq	0.14	Benin	0.35	Hungary	0.32	Canada	0.29
Gambia	0.15	Philippines	0.35	Taiwan	0.34	Barbados	0.31
Chad	0.17	Macedonia	0.36	Mauritius	0.35	France	0.34
Eritrea	0.17	Lebanon	0.37	Qatar	0.36	Germany	0.34
India	0.17	Paraguay	0.37	Slovenia	0.37	Portugal	0.34
Mali	0.17	Honduras	0.39	Croatia	0.38	Hong Kong	0.44
Nepal	0.17	Moldova	0.39	Slovakia	0.38	Austria	0.49
Tajikistan	0.17	Cote d'Ivoire	0.40	Bulgaria	0.41	Chile	0.49
Kenya	0.18	Tanzania	0.40	Estonia	0.41	Ireland	0.53
Bosnia & Herz	0.19	Mozambique	0.41	South Africa	0.41	Japan	0.53
Senegal	0.19	Ukraine	0.41	South Korea	0.41	Luxemburg	0.57
Venezuela	0.19	China	0.44	Greece	0.42	Israel	0.64
Angola	0.20	Nigeria	0.44	Jordan	0.42	Belgium	0.88
Ghana	0.20	Zambia	0.44	Belize	0.43	Spain	1.02
Turkmenistan	0.20	Pakistan	0.46	Oman	0.43		
Gabon	0.21	Ethiopia	0.53	Brazil	0.45		
PNG	0.21	Morocco	0.54	Peru	0.46		
Russia	0.21	Madagascar	0.58	Cuba	0.48		
Algeria	0.22	Bangladesh	0.61	United Arab Emirates	0.49		
Egypt	0.23	Malawi	0.63	Czech Rep.	0.54		
Nicaragua	0.24	Suriname	0.70	Latvia	0.57		
Sri Lanka	0.24	Zimbabwe	0.73	Saudi Arabia	0.57		
Libya	0.25	Argentina	0.74	Namibia	0.63		
Romania	0.25			Colombia	0.64		
Syria	0.25			Poland	0.68		
Armenia	0.26			Costa Rica	0.74		
Dominican. Republic.	0.26			Italy	0.74		
Kazakhstan	0.26			Trinidad &Tobago	0.76		
Palestine	0.26			Uruguay	0.84		
Azerbaijan	0.28			Belarus	0.89		
Average SD			**0.29**		**0.43**		**0.37**

Note: SD is standard deviation, CPI is corruption perception index, MCOR is most-corrupt countries, MEDCOR is medium-corrupt countries and MCLEAN is mostly-clean countries.

It is evident that, overall, the perceptions of corruption show little variation over time (Table 3.1). Except for Spain the standard deviation values of the observed CPI scores are all less than one. Spain exhibits the maximum variation of CPI scores with a standard deviation value of 1.02. On the other end of the spectrum, the Democratic Republic of Congo and the Republic of Congo represent the lowest standard deviation of CPI scores of 0.06. These two countries belong to the MCOR group where the average standard deviation value for this group is 0.29, i.e. the lowest among the three groups. This indicates that the most-corrupt countries are least volatile and their scores are highly consistent over time. In comparison, the MCLEAN and MEDCOR groups of countries show more volatility in perception of corruption. Overall, the MEDCOR countries are the most volatile group.

The observed volatility of CPI scores for MCLEAN countries is mainly due to high standard deviation values of Spain, Belgium and Israel, which make the average standard deviation value for the group relatively high in comparison with the MCOR countries. However, the average standard deviation values of CPI for MCLEAN and MCOR groups of countries are less than the average standard deviation value of MEDCOR group of countries. It suggests that corruption perceptions indices are more volatile for the medium-corrupt countries. This high volatility of perceptions of corruption is particularly observed in the case of Belarus, Costa Rica, Italy, Poland, South Africa, Trinidad and Tobago, and Uruguay over the period 1995 to 2006. Conversely, Malaysia is the most stable country in Group 2 (i.e. medium-corrupt countries) that obtains the lowest standard deviation value of 0.16. When compared to the most-corrupt group of countries (i.e. Group 1), Malaysia is comparatively volatile as its standard deviation value is quite high relative to the standard deviation values of top stable 14 countries in MCOR group. Moreover, the volatility of Malaysia is not only higher than The Republic of Congo (i.e. most-corrupt) but has higher volatility compared to New Zealand that is the most-clean country.

Amongst the MCOR group of countries, Argentina, Bangladesh, Malawi, Suriname and Zimbabwe demonstrate the highest levels of volatility in the CPI scores, whereby these countries exceed the expected stability in Group 1. Although, the CPI scores for most of the countries are quite stable over time it improves for some countries

and deteriorates for others. In addition, the improvements or deteriorations of CPI scores move some countries between groups; for instance, some countries move from Group 1 to Group 2 or from Group 2 to Group1. Based on the findings in Table 3.1, the next step involves examining which countries have improved or deteriorated over time.

The movement of the countries between each group over the period 1995-2006 is shown in Table 3.2. It is apparent from Table 3.2 that the CPI scores improve over time for Bulgaria, Croatia, Italy, Latvia, Lebanon, and Thailand. The improvements in CPI scores shift these countries from most-corrupt group (Group 1) to the medium-corrupt group, i.e. Group 2. In contrast, a large decline in the CPI scores of Belarus, Bolivia, Malawi, Morocco, Mozambique, Peru, Romania, Suriname, Zambia and Zimbabwe shift these countries from Group 2 (medium-corrupt) to Group 1 (most-corrupt), suggesting that the perception of corruption increases for these countries over time. On the other hand, Brazil, China, Colombia, Ghana, Panama, Philippines and Turkey show improvement as well as deterioration in the CPI scores over time, i.e. they shift either from most-corrupt (Group 1) to medium-corrupt (Group 2) group or from medium-corrupt (Group 2) to most-corrupt (Group 1) group over time.

The improvement in Brazil's CPI score moves the country from Group 1 to Group 2 in 1996-1997, however deterioration of the CPI score in 2005-2006 shifts the nation to Group 1 (i.e. most-corrupt group). Spain and Estonia experience a large increase in CPI score that shifted these countries from the MEDCOR to MCLEAN group over time. The frequent change in CPI for Belgium, Chile, Japan and France first move these countries from mostly-clean group (Group 3) to medium-corrupt group (Group 2) and then recede to mostly-clean group (Group 3). Overall, the movement of countries between groups shows that MEDCOR countries are more volatile in comparison with the MCOR and MCLEAN countries. Amongst the 42 MEDCOR countries, 23 countries (i.e. 55%) move between groups whereas 5 out of 26 MCLEAN countries (i.e. 19%) and 14 out of the 77 MCOR countries (i.e. 18%) interchange between groups over time. The results suggest that variability of CPI scores for the MEDCOR group (Table 3.2) are consistent with the highest estimated

average standard deviation CPI value for this group (see Table 3.1) for the period 1995-2006.

The last step tests the variability of CPI scores to examine any significant improvement and/or deterioration over time. In order to derive the change in CPI score for the MCOR, MEDCOR and MCLEAN groups of countries we utilise the First-Order Autoregressive models for all countries. The model takes the following form:

$$CPI_{i,\,t} = \delta_0 + \delta_1 t + u_{i,\,t} \qquad (3.1)$$

where, $u_{i,\,t} = \rho\, u_{i,\,t-1} + e_{i,\,t}$, i is country and t is time period from1995 to 2006.

Table 3.2 Movement of countries between groups over time, 1995-96 to 2005-2006

Improve	**1995-96**	**1996-97**	**1997-98**	**1998-99**	**1999-2000**	**2000-01**	**2001-02**	**2002-03**	**2003-04**	**2004-05**	**2005-06**
Group 1→ 2	Italy[1]	Brazil [1]	China[1] Turkey[2]	Latvia[1] Mexico[1] Senegal[1] Philippines[1]	Bulgaria[1] Croatia[1] Ghana[1] Argentina[1]	Mexico[3] Colombia[2] China[3] Egypt[1]	Dominican Republic[1]	Panama[2]	Ghana[3] Thailand[1]	Jamaica[2] Egypt[3] Turkey[4]	Lebanon[1]
Group 2→ 3		Portugal[1]	Chile[2] France[2]	Portugal[3]	France[4] Spain[1]	Israel[2] Japan[2]	Belgium[2]	France[6]			Estonia[1]
Deteriorate											
Group 2→ 1	Colombia[1]	Turkey[1] Bolivia[1] Argentina[1]	Romania[1]		Mexico[2] China[2] Phillipines[2] Mozambique[1] Zimbabwe[1]	Senegal[2] Malawi[1] Zambia[1]	Panama[1] Turkey[3] Argentina[3]	Dominican – Republic[2] Egypt[2] Morocco[1] Ghana[2] Ethiopia[1]	Belarus[1] Jamaica[1]	China[4] Sri Lanka[1] Suriname[1]	Saudi-Arbia[1] Trin.& Tobago[1] Brazil[2] Peru[1] Mexico[4] Panama[3] Syria[1] Egypt[4] Ghana[4] Lestho[1] Burkina- Faso[1]
Group 3→ 2		Belgium[1] Chile[1] Japan[1] France[1]	Portugal[2]	France[3]	Israel[1] Portugal[4]		France[5]		Israel[3]	Malta[1]	

Note: Number in the superscript denotes number of movement between groups of each country. Group 1 is most-corrupt countries, Group 2 is medium-corrupt countries and Group 3 is mostly-clean countries.

The regression results for the significant changes are reported in Table 3.3. The positive/negative signs of the trend coefficients indicate improvement/deterioration of corruption perceptions over time. The negative sign of the coefficient manifests a significant decline in the CPI for countries such as Cote d'Ivoire, Israel, Malawi and Namibia. On the contrary, a positive sign of the coefficient shows an improvement in CPI, for example in Belgium, Colombia, Jordan and Uruguay. The highest estimated negative magnitude of Namibia and the highest positive magnitude of Uruguay indicate that Namibia experienced the highest deterioration while Uruguay show the highest improvement in CPI, over time, amongst all countries. These results are consistent with the estimated high standard deviation values of CPI for Namibia and Uruguay seen in Table 3.1. The large significant changes of these two countries CPI scores (Table 3.3) suggest that the perceptions of corruption are quite volatile.

The results in Table 3.3 also confirm the hypothesis that the MEDCOR group of countries are relatively more volatile than MCLEAN and MCOR group of countries. The number of countries exhibiting significant changes in the CPI scores is greater for MEDCOR group and the trend coefficient values of these countries are also relatively higher compared to other two groups. The result obtained here leads to the next step of the hypotheses to test whether the CPI scores reflect movement towards general consensus of corruption perceptions over time.

3.3.2. Empirical results for the standard deviation of CPI rankings

The empirical results based on the standard deviation of the rankings of CPI scores provide deeper insights about the perceptions of corruption. The scatter plots illustrated in Figure 3.1 are fitted with local polynomial Kernel regressions for each year between 1995 and 2006.

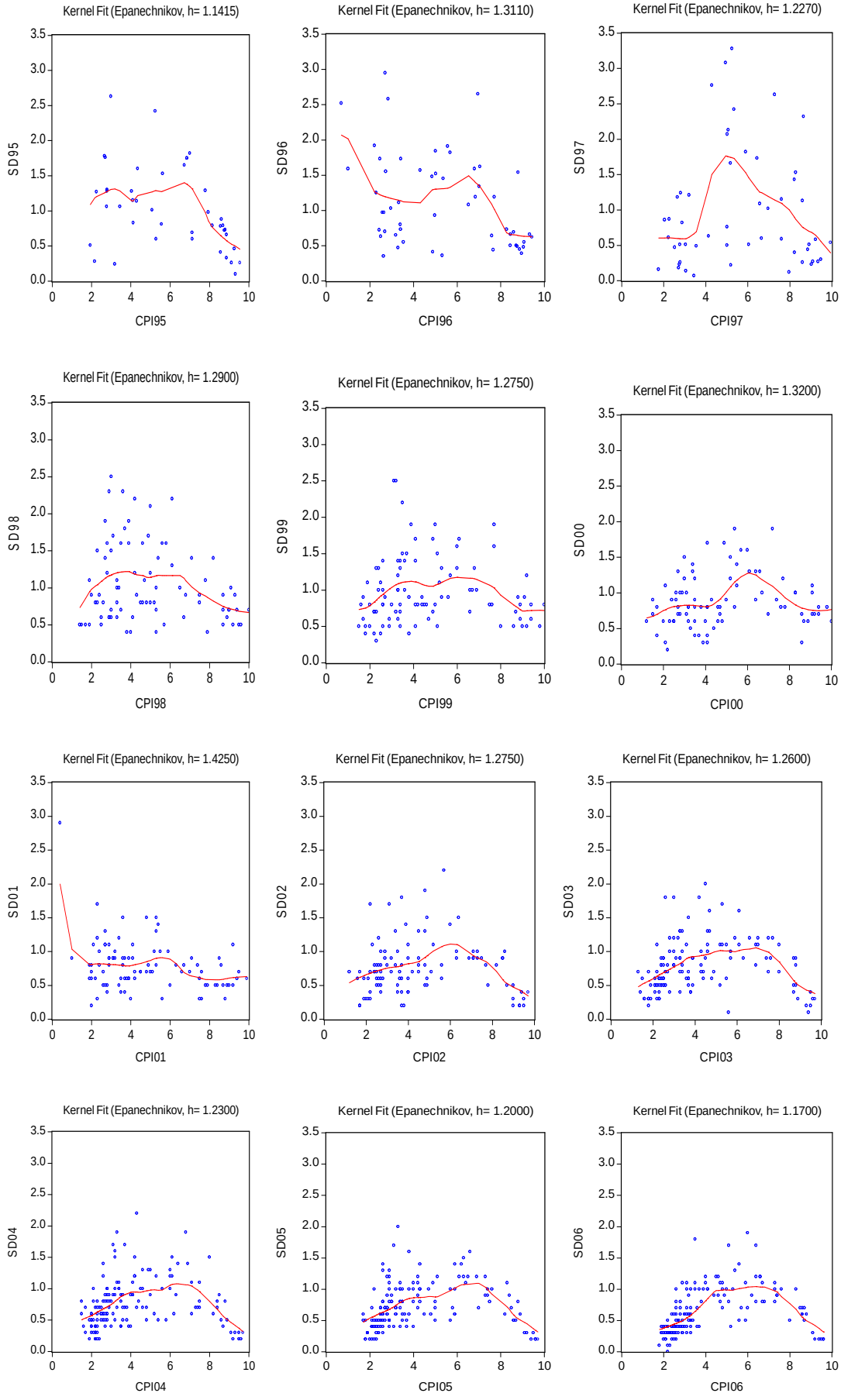
Two key observations are noted in Figure 3.1; first, the best fitted Kernel curves become smoother and closer to the X-axis over time. The smoothness of the plots reflects a lesser degree of deviation in the opinions about the perceptions of corruption of a country. This provides support to the view that corruption perceptions move towards general agreement over time.

Table 3.3 Regression results of significant improvement/deterioration of CPI scores

Countries with declining CPI	Trend coefficient	Countries with improving CPI	Trend coefficient
Canada[3]	-0.104 (2.756)	Iceland[3]	0.080 (4.309)
Israel[3]	-0.162 (2.263)	New Zealand[3]	0.032 (3.807)
Botswana[2]	-0.046 (2.158)	Singapore[3]	0.066 (5.980)
Namibia[2]	-0.246 (2.554)	Austria[3]	0.113 (4.825)
South Africa[2]	-0.098 (6.187)	Hong Kong[3]	0.110 (5.196)
Costa Rica[2]	-0.166 (3.489)	Belgium[3]	0.260 (2.242)
Greece[2]	-0.106 (3.531)	Chile[3]	0.106 2.456)
Croatia[2]	-0.117 (5.534)	Slovenia[2]	0.153 (3.195)
Peru[2]	-0.178 (13.970)	Taiwan[2]	0.084 (4.221)
Dominican Republic[1]	-0.151 (3.845)	Uruguay[2]	0.265 (11.833)
Malawi[1]	-0.189 (1.980)	Jordan[2]	0.157 (2.937)
Cote d'Ivoire[1]	-0.125 (6.065)	Latvia[2]	0.179 (9.436)
		Colombia[2]	0.199 (4.345)
		Thailand[1]	0.057 (3.272)
		Tanzania[1]	0.133 (10.458)
		Angola[1]	0.115 (8.873)
		Azerbaijan[1]	0.103 (2.801)
		Cameroon[1]	0.078 (2.182)
		Bangladesh[1]	0.217 (15.905)

Note: 1, 2 and 3 denote countries in Group 1 – Most -Corrupt, Group 2 – Medium-Corrupt, and Group 3 as Mostly-Clean, respectively.
t-values are in the parenthesis.

Figure 3.1 Kernel fits of standard deviations of CPI ranking and CPI scores



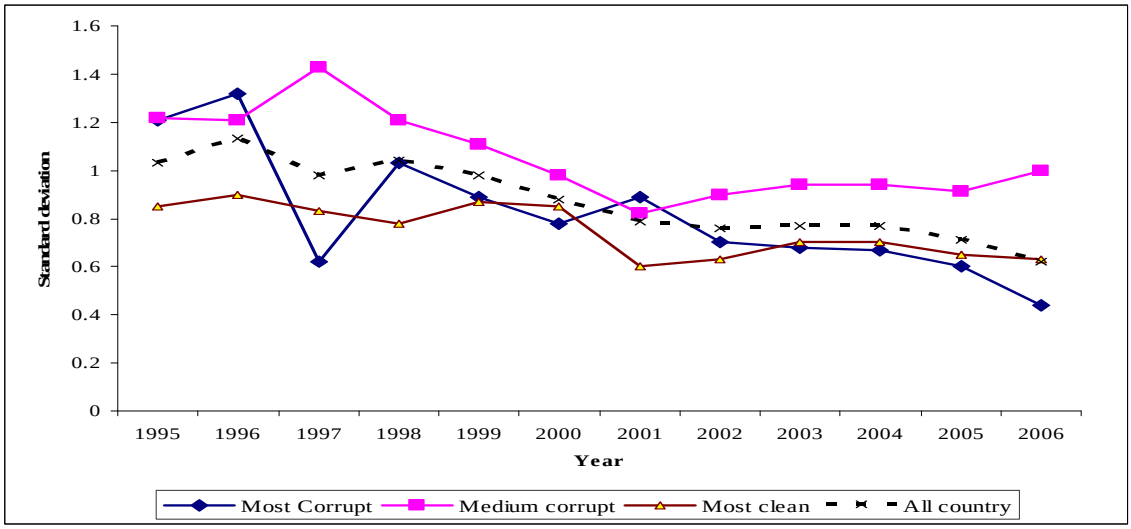
The plots are widely scattered in 1995, 1996 and 1997 over the range of 0.10 to 2.63, 0.36 to 2.65 and 0.12 to 3.28, respectively, with an average standard deviation of the ranking of CPI value greater than 1 for these years. This explains the existence of a higher level of diversion in opinion about the perceptions of corruption in the mid-1990s. On the contrary, the average variation of the CPI ranking is less than 0.8 in 2001, 2002 and 2003 that confirms the deviation in the opinions declines over time with few exceptions. The exceptions represent outliers in the rankings of CPI which are mainly due to the inclusion of some countries ranked by TI for the first time that exhibit higher standard deviation values of the rankings.

The second observation is that the Kernel curves take the shape of inverted-U over time. The inverted-U Kernel curves demonstrate that at low and high levels of CPI (i.e. most-corrupt and mostly-clean groups of countries) there is a higher degree of agreement about the incidents of corruption in a country, whereas there is a greater disparity amongst various opinion polls on the incidence of corruption in the medium level of CPI. This implies that standard deviation values of CPI rankings are higher for the MEDCOR group in comparison with MCOR and MCLEAN groups. Thus, MCOR and MCLEAN groups reflect consensus in the polar cases.

The observations noted above are also quite apparent, as seen in Figure 3.2, for each group of countries over the period 1995-2006. The estimated average standard deviation values of CPI rankings of MCLEAN group of countries drop from an average of 0.85 in 1995-2000 period to 0.65 for the period 2001-2006. The MEDCOR group of countries shows a declining trend in the standard deviation values up to 2001, and increases steadily after this period. The MCOR group of countries exhibits an overall declining pattern except for a few years due to the inclusion of new-entrant countries. As noted above, these newly-entered countries normally tend to be highly corrupt given their very high standard deviation values. For example, Bangladesh, Cameroon, Kenya, Nigeria and Uganda are included in the CPI ranking list in 1996 with high standard deviation values that increase the overall average standard deviation value of CPI rankings. Hence, the standard deviation of the rankings of CPI scores decreases for all countries as evident in the average standard deviation curve (see Figure 3.2).

The boxplot diagram in Figure 3.3 displays the summary data of standard deviation values of CPI rankings for upper, middle and lower quartiles (i.e. 75th percentile, 50th percentile and 25th percentile), and the minimum and maximum values. The range of upper and lower quartiles decreases from 1995 to 2006, this confirms the second hypothesis that opinion polls about the perceptions of corruption in a country tend towards general agreement. The median value depicted by the line decreases sharply in 2006 compared to 1995, i.e. from 0.9 to 0.5. Moreover, the confidence intervals of the median (denoted in the shaded range) become narrower over time. Figure 3.3 also shows the points outside the whiskers that represent outlier countries (such as Bangladesh, Nicaragua) in 1997 and 2001.[16]

Figure 3.2 Variation of the average standard deviations of CPI rankings over time



The declining trends in standard deviation of CPI ranking values in Figures 3.1, 3.2 and 3.3 confirm the hypothesis that the degree of disagreement among the various polls decline over time. In other words the subjective indexing process of corruption perceptions converges towards a general agreement. The convergence towards the general agreement reflects analogous results that explain why the countries are indicated as most-corrupt or corruption-free groups. Also, the general consensus provides assurance on the reliability of the perceptions based indices.

[16] TI ranked Uganda and Bangladesh for the first time in 1996. Bangladesh was not ranked from 1997 to 2000 but listed since 2001. Three independent survey sources used for Bangladesh in 2001 yield different results that inflate the standard deviation values, this is explained in detail at the site www.transparency.org/policy_research/surveys_indices/cpi/2001.

Another key finding in the analysis is that amongst the three different groups the MEDCOR group of countries represents the overall highest standard deviation of CPI ranking values. This indicates the differences in opinion polls amongst various sources which are the greatest for the MEDCOR group. The inverted-U Kernel curves in Figure 3.1 show that the points in the middle range of CPI values are widely scattered and away from the Kernel Fitted lines, supporting also the highest level of disagreement among opinion polls for MEDCOR group of countries. On the contrary, the points relating to low and high CPI values are located close to the Kernel curves and X-axis illustrating high consensus on incidence of corruption. Figure 3.2 also confirms that MEDCOR group has higher standard deviation values than the MCOR and MCLEAN groups, except for 1996 and 2001. The high standard deviation values of CPI rankings of MEDCOR group indicate that these medium-corrupt countries are more volatile and it represents a high level of disagreement in the opinion polls.

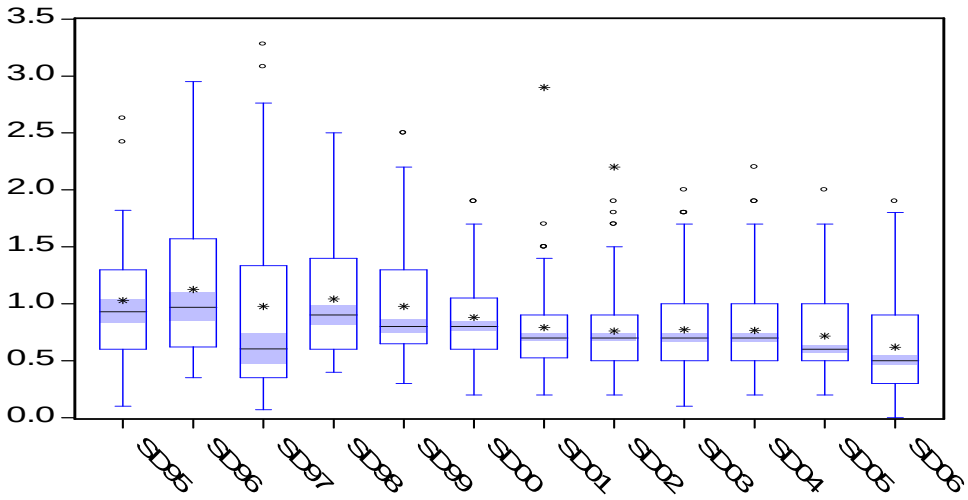
The high level of disagreement of opinions polls on the corruptness of the MEDCOR group of countries is confirmed by averaging the mean values of standard deviation of the rankings of CPI. The estimated average value for the MEDCOR group is 1.01 which is higher than MCOR and MCLEAN groups of countries with values of 0.72 and 0.78, respectively (Table 3.4). The average value of greater than 1 for the MEDCOR group of countries suggests that these countries are quite unpredictable to the general agreement on corruption perceptions. This confirms the proposition that the level of corruption is less predictable for the MEDCOR group of countries while the MCOR and the MCLEAN groups of countries are highly predictable in regard to the perceptions of corruption.

Table 3.4 Average standard deviations of the rankings of CPI over the period 1995-2006

Group 1	Avg. SD	Group 1 (cont.)	Avg. SD	Group 1 (cont.)	Avg. SD	Group 2	Avg. SD	Group 2 (cont.)	Avg. SD	Group 3	Avg. SD
Mexico	0.55	Suriname	1.20	Ukraine	0.80	Portugal	1.01	Greece	1.26	Finland	0.39
China	0.73	Eritrea	1.27	Zimbabwe	1.01	Oman	1.23	South Korea	1.13	Iceland	0.62
Panama	0.65	Nicaragua	1.03	Congo Dem.Rep.	0.40	Bahrain	0.75	Belarus	1.34	Denmark	0.48
Sri Lanka	0.64	Yemen	0.53	Congo, Rep. of	0.30	Cyprus	0.78	Brazil	0.61	New Zealand	0.45
Syria	1.00	Albania	0.50	Ecuador	0.64	Slovenia	1.18	Bulgaria	1.08	Singapore	0.73
Bos.& Herzeg	0.50	Argentina	0.81	Iraq	0.88	Malta	1.73	Czech Republic	0.92	Sweden	0.38
Dom. Rep.	0.63	Ethiopia	0.62	Sierra Leone	0.40	Botswana	1.39	Jamaica	0.47	Netherlands	0.47
Egypt	1.09	Gambia	0.73	Uganda	0.85	Taiwan	0.92	Latvia	0.94	Australia	0.78
Ghana	0.88	Pakistan	1.00	Cote d'Ivoire	0.74	Qatar	0.50	Colombia	0.80	Norway	0.66
Morocco	1.14	Philippines	0.78	Kyrgyzstan	0.40	Estonia	0.90	Croatia	0.50	Switzerland	0.51
Thailand	0.75	Tanzania	0.69	Libya	0.60	Uruguay	0.77	El Salvador	1.42	Canada	0.59
Senegal	0.90	Mongolia	0.67	Papua New	0.63	Italy	1.17	Seychelles	0.60	Luxembourg	0.82
Armenia	0.58	Zambia	0.87	Guinea		Kuwait	1.18	Peru	0.68	United Kingdom	0.59
Iran	0.78	Guatemala	0.86	Indonesia	0.63	Malaysia	0.74	Slovakia	1.02	Austria	0.66
Lebanon	0.63	Kazakhstan	0.96	Niger	0.33	United Arab	1.08	Poland	1.20	Hong Kong	1.21
Mali	1.30	Turkmenistan	0.37	Kenya	0.60	Emirates		Turkey	0.92	Germany	0.69
Palestine	0.73	Moldova	0.83	Angola	0.28	Tunisia	1.28			Belgium	1.29
India	0.55	Uzbekistan	0.58	Azerbaijan	0.41	Hungary	0.90			Ireland	1.06
Lestho	0.65	Venezuela	0.60	Cameroon	0.60	Lithuania	1.19			United States	0.94
Burkina Faso	0.65	Vietnam	0.58	Georgia	0.60	Namibia	1.17			Chile	0.89
Malawi	0.78	Bolivia	0.71	Tajikistan	0.35	Cuba	1.53			Israel	1.04
Romania	0.80	Benin	1.17	Myanmar	0.28	Jordan	0.89			Japan	1.28
Mozambique	0.78	Nepal	0.70	Paraguay	0.50	Trinid.&	1.18			France	1.11
Russia	0.85	Honduras	0.58	Haiti	0.70	Tobago				Spain	1.02
Algeria	0.60	Macedonia	0.66	Nigeria	0.68	Belize	0.70			Barbados	0.90
Madagascar	1.28	Serb.& Monte.	0.60	Bangladesh	1.04	Saudi Arabia	1.25				
Gabon	0.90	Sudan	0.23			Mauritius	0.94				
						South Africa	1.08				
						Costa Rica	1.22				
Average of Average SD				**0.72**					**1.01**		**0.78**

Note: Group 1 is most-corrupt countries, Group 2 is medium-corrupt countries and Group 3 is mostly-clean countries and Avg. SD is average standard deviation..

Figure 3.3 Boxplots of standard deviation of the rankings of CPI, 1995 to 2006



3.4 Conclusion

This chapter has examined the variability and convergence towards general agreement of the corruption perceptions index for the period 1995 to 2006. The results indicate that the degree of perception about the incidents of corruption is persistent for the mostly-clean and the most-corrupt group of countries where the mostly-clean countries stay clean and the most-corrupt countries remain corrupt. In contrast, the medium-corrupt countries exhibit an unpredictable nature of incidents of corruption over time. The declining trend of the standard deviation of corruption perceptions index confirms that the general consensus is to convergence over time. The general agreement reflects a greater predictability about the level of corruption that reduces the risk and uncertainty and favours policy recommendations relating to economic variables and/or doing business in a country. This finding increases the reliability and scope of using the perceptions based index as a credible quantitative measure of corruption.

CHAPTER 4

Does Economic Development Matter For the Causes of Corruption?

4.1 Introduction

It has now been firmly established that the impact of corruption is detrimental, which explains the poor economic performance, especially in the context of developing economies.[17] Although corruption is viewed as one of the most severe bottlenecks in the process of economic development, very little is known of what factors cause corruption and why some countries are more corrupt than others. An important research question is therefore, what causes corruption? With few exceptions, majority of the empirical studies on corruption have examined various country case studies of nations or regions, however, cross-sectional comparative empirical research is fairly uncommon.[18] Some recent studies have begun to address those challenges in a systematic way, notably Triesman (2000) and Sandholtz and Koetzle (2000). These cross-sectional studies analyse the causes of corruption; in particular with historical and cultural traditions, level of economic development, political institutions, and government policies.

This study defines corruption as misuse of public office for private enrichment. The objective of this chapter is to examine the social and economic determinants of corruption and its implications for economic development. The study contributes to the existing literature in three different ways. First, it analyses what economic and political factors are the root causes of corruption. For a comparative analysis of corruption, in addition to real gross domestic product (GDP) per capita various socio-economic variables are identified, such as education, income inequality, unemployment, type of state and economic freedom. The variations in corruption are also examined across

[17] For example see Rose-Ackerman (1978), Klitgaard (1988), Mauro (1995), Knack and Keefer (1995), Bardhan (1997) and Brunetti et al. (1998) for details.

[18] See Hellman (1998), LeVine (1975), Little and Posada-Carbo (1996), Maclean (1993), Manzetti and Blake (1996), Morris (1991), Palmier (1985) and Williams (1987) for details.

regions in order to explain whether corruption is endemic to particular regions or countries. Second, the relationship between economic development and corruption is investigated by categorising countries into low-income, middle-income and high-income groups, in line with the international practice. Third, it scrutinises the level of per capita income and the corruption relationship in a non-linear functional form for various groups of countries based on income classification and by controlling several relevant economic and institutional factors. Panel data estimations are used to explain the variations in the causes of corruption by extending and updating the sample size from previous studies for 100 nations for the period 1995 to 2004.

The set of hypotheses focused on in this chapter explains the level of variations in corruption across countries. In examining various hypotheses by income classification and regions the study attempts to first answer if corruption is lower in more economically developed countries and/or higher in developing countries. The second question is whether corruption is lower with high levels of literacy and education. Third, does higher income inequality increase corruption? Fourth, is corruption higher with high levels of unemployment? Fifth, is corruption lower in democratic countries? Sixth, does higher economic freedom reduce corruption?

The chapter is organised as follows: theoretical perspectives on corruption are discussed next. Section 4.3 presents the empirical models, data and methodologies. Section 4.4 discusses the estimation results, and the robustness tests which are in section 4.5. Conclusions are noted in the final section.

4.2 Determinants of Corruption: Theory

An immediate question arises: why do some public officials practice illegitimate transactions for private enrichment in some countries more than in others? The public official infers the expected cost of a corrupt act (i.e. moral, social and economic costs) against the expected benefit. The expected costs and benefits can very much depend on the characteristics of the countries' economic, political and social systems.

The most obvious cost of a corrupt act is the risk of getting caught and punished. Besides the probability of getting caught, officials consider the consequences of being

caught. The punishments for criminal malfeasance are obviously relevant. Short of prosecution, miscreants are likely to lose their jobs. The cost of this depends upon the benefit provided by the job, which is essentially the level of salaries in public office (Becker and Stigler, 1974). Thereby, higher salaries of officials make corruption more costly.

Following the view that high incomes of officials increase the opportunity cost of acting corruptly, it is expected that poor countries will be more corrupt than rich countries. In this context, Sandholtz and Koetzle (2000, pp. 36-37) points out that because of the high marginal value of money in poor countries, any extra income substantially affects both givers and takers of bribes. Paying a bribe can be a beneficial expense if it creates opportunities for higher income gains. Likewise, receiving a bribe generates a direct boost in income for public officials, such that the risk is judged as being worthwhile.

Economic development is usually associated with higher literacy rates and general educational levels. Hence, these can be important explanatory variables in explaining the variations in corruption across developed and developing nations. Education may help to generate moral values against corruption. Hauk and Saez-Marti (2002) examines, in an overlapping generations model with intergenerational transmission values, that if young people are educated to adopt a moral attitude against corruption then high fines or monitoring can be reduced while low corruption levels are achieved. Thus, educating the young could be a key element in reducing corruption successfully. A high level of education often also fosters a sense of patriotism and civic duty in the citizenry. It also raises the public's awareness of their rights, responsibilities and duties (Ali and Isse, 2003). Generally, most citizens in developing countries are not fully aware of their public entitlements. As a consequence, the general public's ignorance provides opportunities for large scale corruption in developing countries. Thus, it is expected that corruption levels to fall where populations become more educated and literate.

Income inequality can increase the level of corruption because, with increased inequality, richer people have greater ability to pay bribes to buy public services, both

legally and illegally (Glaeser, Scheinkman and Shleifer, 2003). You and Khagram (2005) points out that the wealthy have both a greater motivation and more opportunity to engage in corruption, whereas the poor are more vulnerable to extortion and less able to monitor and hold the rich and powerful accountable, as inequality increases. Moreover, in countries where inequality is high, a large number of poor people are more likely to be deprived of basic public services, and hence they are more likely to rely on petty corruption to supplement their low incomes. Accordingly, inequality can be expected to foster more widespread corruption.

In developing countries unemployment and underemployment rates are usually high. The demand for stable sources of income is high and therefore, to secure an earning position with stability and reasonable income opportunity, people are willing to make huge investments. The study on the process of buying and selling civil service positions in Indonesia by Kristiansen and Ramli (2006) reveals that prices for positions have been rising, and they vary among departments in accordance with available opportunities to boost income. Thus a high level of unemployment can help explain the observed variations in corruption, particularly in developing countries.

There is a growing consensus that more democracy means less corruption. However, the generally observed increase in corruption levels in transitional economies is not consistent with the view that democracy has a negative impact on the level of corruption. Moreover, some countries experienced less corruption although they do not enjoy a liberal political environment. Thus, it raises an interesting question as to whether democracy can reduce corruption. However, several studies have found that democracy tends to reduce corruption (Sandholtz and Koetzle, 2000; Montinola and Jackman, 2002; Sung, 2004; Bohara et al., 2004). According to these studies in democracies, freedom of expression, association and press lead to closer monitoring which in turn increase the risk of exposure of unjust activities. Accordingly, it is expected that democracy prevents corruption.

Like political liberalisation, many nations have stimulated economic liberalisation for curbing corruption, as an environment of regulation provides opportunities and incentives for rent seeking behaviour. More regulation means firms enjoy higher rents,

and the bureaucrats with control rights over them have higher incentives to engage in corrupt behaviour. In this context, Ades and Di Tella (1999) argues that the lack of product market competition offers greater potential gain to public officials of countries with large endowments of natural resources such as fuels, minerals and metals, and this promotes corruption. Thus, it is expected that competition and corruption are negatively related.

From the above arguments the following variables are taken as key determinants of corruption:

i. Corruption is lower in more economically developed countries, and higher in developing countries.
ii. Corruption is lower where populations are more educated and literate.
iii. Corruption is higher where income inequality is greater.
iv. Corruption is higher with higher levels of unemployment.
v. Corruption is lower in democratic countries.
vi. Corruption is higher with greater state intervention in the economy.

Based on the above hypotheses, the dependent and the explanatory variables taken into account in the study and their expected signs are summarised in Table 4.1.

Table 4.1 Dependent and independent variables and their expected signs

Dependent Variable: Corruption Perception Index	
Independent Variables	**Expected Sign**
Level of Per Capita Income	Negative
Gini Coefficient	Positive
Unemployment Rate	Positive
Adult Literacy Rate	Negative
Tertiary Level of Education	Negative
Democracy	Negative
Economic Freedom	Negative

4.3 Models, Data and Methodology

The models, data and methodology used to estimate the hypotheses are presented in this section to explain the levels of variation in corruption across countries and regions. First, model specifications are discussed, followed by an outline of explaining the data and methodology used here.

4.3.1 Model specification

The empirical analysis evaluates the various hypotheses proposed in the study. Similar to most past empirical work in the corruption literature, the dependent variable is corruption as measured by the corruption perception index. We begin the analysis by focusing on the level of per capita income, represented by real per capita GDP, and its influence on corruption. The base model is formed by incorporating other socio-economic and institutional variables, as right-hand side variable. These include real per capita GDP to focus on the influence of per capita income on corruption, gini coefficient (that measures income inequality), unemployment rate, tertiary level of education, and adult literacy rate that examines the effect of social factors, and democracy and economic freedom variables that reflect the institutional impact. The base model specification takes the following form:

$$CPI_{i,t} = \beta_0 + \beta_1 \log (RGDP)_{i,t} + \beta_2 GINI_{i,t} + \beta_3 UNEM_{i,t} + \beta_4 ALR_{i,t} + \beta_5 LED_{i,t} + \beta_6 DEMO_{i,t} + \beta_7 EF_{i,t} + \varepsilon_{i,t}, \quad (4.1)$$

where CPI is corruption perceptions index, RGDP is the real per capita GDP, GINI is the gini coefficient for measuring income inequality, UNEM is the unemployment rate, LED is the tertiary level of education, ALR is the adult literacy rate, DEMO is a democracy index, EF is an economic freedom index, ε is error term, i is country and t is time.

The previous section described theories behind the proposed hypothesis about the causes of cross-national variations in corruption. Given that each element derives from the theoretical literature in economics and political science, as noted above, the signs of the coefficients β_1, β_4, β_5, β_6 and β_7 in equation (4.1) are expected to be negative whereas the signs of β_2 and β_3 are expected to be positive.

The base model shown above is extended to incorporate regional classification and income classification of countries and the lagged perception of corruption. The extended models allow us to ascertain whether the estimated relationships between corruption and other explanatory variables are robust across alternative model

specifications, and whether they provide additional evidence on the effects of the other variables themselves on corruption across groups by regions and income.

Estimating the level of corruption by regions and income classifications of countries are expressed in equations (4.2) and (4.3), respectively as follows:

$$CPI_{i,t} = \beta_0 + \beta_1 \log (RGDP)_{i,t} + \beta_2 GINI_{i,t} + \beta_3 UNEM_{i,t} + \beta_4 ALR_{i,t} + \beta_5 LED_{i,t} + \beta_6 DEMO_{i,t} + \beta_7 EF_{i,t} + \beta_8 \text{Asia} + \beta_9 \text{Latin America} + \beta_{10} \text{Africa} + \beta_{11} \text{Middle East} + \beta_{12} \text{East Europe} + \mu_{i,t}, \quad (4.2)$$

$$CPI_{i,t} = \beta_0 + \beta_1 \log (RGDP)_{i,t} + \beta_2 GINI_{i,t} + \beta_3 UNEM_{i,t} + \beta_4 ALR_{i,t} + \beta_5 LED_{i,t} + \beta_6 DEMO_{i,t} + \beta_7 EF_{i,t} + \beta_8 \text{Middle-income countries} + \beta_9 \text{High-income countries} + \nu_{i,t}, \quad (4.3)$$

where μ and ν are the error terms. The next step tests the income-corruption relationship in a non-linear framework. The non-linear model is estimated using the following equation:

$$CPI_{i,t} = \delta_0 + \delta_1 \log (RGDP)_{i,t} + \delta_2 [\log (RGDP)_{i,t}]^2 + \delta_3 ALR_{i,t} + \delta_4 LED_{i,t} + \delta_5 GINI_{i,t} + \delta_6 UNEM_{i,t} + \delta_7 DEMO_{i,t} + \delta_8 EF_{i,t} + \zeta_{i,t}, \quad (4.4)$$

where ζ is the error term. For the estimation of the non-linear relationship the signs of δ_1 and δ_2 in equation (4.4) are of interest, and it is expected that δ_1 to be positive and δ_2 to be negative. The expected sign of δ_1 and δ_2 represents a parabolic relationship between income per capita and corruption. That is, at a certain value of per capita income the effect of per capita income on corruption is 0; thus, before this point per capita income has a positive effect on corruption; after this point per capita income has a negative effect on corruption. In other words, at the early stages of economic development, an increase in per capita income increases corruption and reaches a maximum level, which is the threshold point, and after the threshold level of income it has a dampening (decreasing) effect on corruption. Hence, it is important to determine the threshold (turning) point.

In the equation (4.4) with $\delta_1 > 0$ and $\delta_2 < 0$, the turning point (or maximum of the function) is achieved where the coefficient of log (RGDP) is over twice the absolute value of the coefficient on $(\log (RGDP))^2$:

$$\log (RGDP)^* = \left| \delta_1/(2\delta_2) \right| \quad (4.5)$$

where $\log (RGDP)^*$ is log (RGDP) at the turning point.

4.3.2 Data description

As discussed in Chapter 3 the major obstacles to the comparative studies of corruption have been the lack of a general definition of corruption and the absence of objective cross-national data on corrupt behaviour. Therefore, the dependent variable in this study is a subjective measure of corruption based on the perceptions of corruption. Transparency International's annual corruption perceptions index is used as a principal measure of corruption.[19] The TI data set is regarded as a reliable quantitative measure for the cross-national comparisons and it covers a large number of countries.[20] For simplicity and ease of exposition, the original ranking of CPI has been converted into a scale from 0 (least corrupt) to 10 (most corrupt). Based on the availability of data, the number of countries included in the study is 100 and is analysed over the period 1995 to 2004. In addition to using CPI, the study utilises a complementary measure of corruption, i.e., the control of corruption index, as an alternative measure of corruption constructed by Kaufmann et al., (2006). Control of corruption index is also subjective in nature, which covers 213 countries and territories and measures the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests, for the period 1996-2005. Similar to CPI, the control of corruption index (CCI) is re-scaled and ranging from 0 to 10, where a higher value indicates greater control of corruption.[21]

[19] The definition of corruption in the study is consistent with the definition of TI.
[20] Chapter 3 discusses TI's corruption perceptions index with a deeper insights, which supports the reliability of using this data set in the empirical studies.
[21] Original control of corruption index is ranging from -2.5 to 2.5.

The level of economic development is measured in terms of the natural logarithm of real GDP per capita using data from Groningen Growth and Development Centre (2004). For the intercountry comparison of economic performance purchasing power parity (PPP) adjusted real GDP per capita is used for the benchmark year 1990, where the primary measure of corruption covers the period from 1995 to 2004. A logarithmic transformation stabilises the variance of the original real GDP per capita values. Also, with an expectation of obtaining the positive effect of economic development on corruption assumes a form of marginally declining returns with increasing development.

The other explanatory variables are related to the socio-economic indicators, viz. GINI, UNEM, LED and ALR, which are obtained from the World Institute of Development Economic Research (2004), *World Income Inequality Database*, Political Risk Services Group (2004) and World Bank (2005), *World Development Indicators*. Institutional variables, i.e. democracy (DEMO) and economic freedom (EF), are obtained from the Freedom House and Heritage Foundation websites, respectively.[22] Following Treisman (2000) imports of goods and services as a percentage of GDP, former British colony and protestant tradition variables are incorporated in the ordinary least square analysis (OLS) for robustness check. Data for imports of goods and services as a percentage of GDP is obtained from the World Development Indicators, World Bank (2005), former British colony is taken from Treisman (2000) and protestant tradition is obtained from La Porta et al. (1998).

Following Nelson and Singh (1998), a democracy variable is constructed by averaging the Freedom House political rights and civil liberties indices. The economic freedom index measures the degree of regulations imposed on the economic activities of a country. The index of economic freedom is an equally weighted index based on eight individual freedom components, viz. business freedom, trade freedom, monetary freedom, freedom from government, fiscal freedom, property right, investment freedom and financial freedom.[23] Like the CPI, democracy and economic freedom

[22] http://www.freedomhouse.org/uploads/fiw/FIWAllScores.xls; http://www.heritage.org/index/

[23] The 'Freedom from corruption' component is taken out from the original economic freedom index constructed by the Heritage Foundation, 2005, as corruption is the dependent variable in the study.

indices are re-scaled from 0 to 10 and a higher value represents greater freedom.[24] Descriptive statistics of the variables are summarised in Appendix Table A4.1. The details of data sources used for the estimations are presented in the Appendix Table A4.2 and the list of the countries included in the models is shown in Appendix Table A4.3.

4.3.3 Econometric methodology

In order to estimate the proposed hypotheses to explain the variations of corruption, the panel estimation methodologies used are based on equations (4.1) - (4.4) for the period 1995 to 2004. However, Treisman (2007) questions about the use of CPI data in longitudinal analysis due to the methodological change and alteration of the set of sources used for constructing CPI over the years by Transparency International. While the methodological adjustments and alterations of sources are considerable, their impact on the CPI is rather small. For example, as the 2002 CPI was determined with the earlier methodology, the result correlates 0.996 with the current one. In spite of the methodological changes, there exists a high numerical continuity of the CPI (Lambsdroff, 2002). As the effect of economic development on corruption is likely to be long term, it is better to consider using a longer time period than a single year. Also, the analysis of variance (ANOVA) of CPI values shows that the variation between countries explained 68 percent of the total variation, whereas 33 percent of the variation is within the countries over time (Appendix Table A4.4). The evidence thus supports the use of panel estimations in the analysis.

The use of panel data for the cross-country analysis can generate clusters or groups where the presence of clustering can lead to serious errors in statistical inference. Moulton (1986, 1990) in examining this issue claims that when the explanatory variables in a regression model are drawn from a population with grouped structure it can result in spurious regression when estimating the effects of variables. Because the regression errors are often correlated within the grouped structure, they fail to account for the correlation of errors within groups. To deal with this possibility, following

[24] The re-scaled value is calculated based on the following formula:
New value = [(Maxnew – Minnew) * (Oldvalue – Minold) / (Maxold – Minold)] + Minnew where Minold is minimum value of the old scale; Maxold is maximum value of the old scale; Oldvalue is actual value in the old scale; Maxnew is maximum value in the new scale and Newvalue is new converted value in the new scale.

Moulton, the cross-section standard errors-corrected regressions are estimated for the entire analysis. This allows for general correlation of observations within a cross-section or cross section heteroskedasticity. In addition, the period standard errors-corrected and generalised least square estimates are computed for the robustness checks. The results of these two types of estimations are shown in the Appendix Table A4.5 – A4.7. In addition, two-way fixed effects and two-way random effects are also estimated. Finally, the Generalised Method of Moments (GMM) estimation is utilised to estimate the effect on corruption using the lagged values of CPI.

As an alternative econometric methodology the study also estimates ordinary least square (OLS) with heteroskedasticity consistent standard errors for the average period 1995-2004 for the robustness check. The use of average data minimises the estimation inefficiency resulting from measurement error due to the difficulty of measuring the actual level of corruption across countries. To examine whether measurement error has an impact on average data, following You and Khagram (2005) the study also estimates single-year OLS regressions for 1995 and 2004.

To address the potential issue of simultaneous causation two-stage least square (2SLS) procedure is used. As the data for the infant mortality rate and clean sanitation are not available annually, hence two-stage least square regressions are estimated for cross-country only. As corruption is likely to reduce economic growth, OLS estimation may overestimate the coefficient for log (RGDP).[25] For estimating 2SLS, some instrumental variable(s) is/are required which may affect economic development, but cannot be affected by corruption. The infant mortality rate and availability of clean sanitation variables, for example, represent some community health indicators which may have an impact on per capita income via productivity and they are highly correlated with economic development. The simple correlation between infant mortality rate and log (RGDP) is -0.87 and that between sanitation index and log (RGDP) is 0.79. As a country's infant mortality rate and access to clean sanitation cannot be directly affected by corruption, however these variables could affect corruption via economic development. Therefore, infant mortality rate (INFM) and sanitation index (SAN) can be used as potential instruments for economic development.

[25] Mauro's (1995) study finds that perceived corruption reduces economic growth.

Some statistics for developed and developing nations also suggest that infant mortality and the level of economic development are highly correlated. For example, infant mortality rates average about 96 per 1000 live births in the least developed countries, compared with 8 in developed countries in 2002 (Todaro and Smith, 2006, p. 55). Like infant mortality, access to sanitation is also correlated positively with economic development. The World Health Organisation (2004) Report suggests that roughly 40 percent of the population do not have access to improved sanitation in Africa, while in Asia, 52 percent are without access to improved sanitation in 2000. However, North America and Europe have higher rates of access at over 90 percent. These two instrumental variables satisfy the required statistical properties.[26]

4.4 Estimation Results

This section analyses the panel least square estimation results of the relationship between corruption and real GDP per capita, as well as other socio-economic and institutional factors. Subsection 4.4.1 below focuses on per capita income and corruption association for all countries covered in the study. Subsection 4.4.2 analyses the relationship for three different groups of countries based on income classification, and subsection 4.4.3 estimates the relationship between corruption and real GDP per capita in a non-linear framework.

4.4.1 Panel estimation results for all countries

The regression results of the base model (equation 4.1), with corruption perception index as the dependent variable are reported in Table 4.2. Column (1) shows the result of hypothesis (1) viz. is corruption lower in more economically developed countries, or higher in developing countries? The coefficient of log (RGDP) has the expected negative sign and is significant at the 1 percent level, indicating that higher real GDP per capita has a dampening effect (i.e. reduces corruption) on the level of corruption. This means that for example, in the case of India, a reduction in corruption from its current level (i.e. average CPI score for 1995-2004 is 7.22) to a level of, say, Hungary (where the average CPI score for the period from 1995 to 2004 is 5.07) would require

[26] Both coefficients are highly significant and the values of adjusted R^2 vary between 0.77 to 0.88 with and without controls. See Table A4.8 for details.

an increase in India's growth rate of real GDP per capita by approximately 106 percent to reduce its corruption level to 5.07.[27]

Column (2) reports the estimation results which include other socio-economic indicators along with real GDP per capita to measure their impact on the level of corruption. The coefficient of log (RGDP) retains its sign and the significance level. Interestingly, the sign of the coefficient of adult literacy rate is positive and highly significant which contradicts the expected negative sign.[28] It indicates that a one standard-deviation increase in the literacy rate increases the CPI by 0.750 points, or 28 percent of a standard deviation in the corruption perception index.[29] This suggests that an increase in literacy rate can lead to corrupt activity in a more efficient and secret manner. The coefficient of tertiary level education is negative and significant at the 1 percent level, suggesting that countries where people have high levels of tertiary education tend to have lower rates of corruption. A one standard-deviation increase in the level of the education variable decreases the CPI score by 0.316 points, or 12 percent of a standard deviation in the corruption perception index.[30] The coefficients of income inequality and unemployment rate are positive (as expected) and significant at the 1 percent level, demonstrating that higher income inequality and unemployment increase corruption. A one standard-deviation increase in gini index and unemployment increase corruption by 0.260 points and 0.256 points, respectively.

[27] In the level-log form of regression equation the change in the dependent variable equals the coefficient of the independent variable divided by 100 and multiplied the value by the percentage change in the independent variable. Thus, an increase in per capita GDP by 106 percent is calculated based on the following form:

(7.22 – 5.07) / 1.994 (coefficient of log RGDP in column (1)) * 100 = 106 percent.

[28] Throughout this chapter, it shows that the adult literacy rate significantly increases the level of corruption with an exception where regional dummies are included in the estimation. It is worth noting that the raw data presents a group of countries with very high level of corruption and literacy rates such as Albania, Azerbaijan, Belarus and Bosnia. In contrast, only Bangladesh represents a high level of corruption and low level of literacy.

[29] A one-standard-deviation increase in literacy rate is calculated by multiplying the coefficient of ALR (0.046) and the standard deviation of ALR i.e., 16.311, which gives 0.750 points. It can also be explained by multiplying 0.750 points by 100 and then divide the result by 2.669 (standard deviation of corruption perception index) which equals to 28 percent of a standard deviation of CPI.

[30] A one-standard-deviation increase of level of education is calculated by multiplying the coefficient of LED (0.015) and the standard deviation of LED i.e., 21.037, which gives 0.316 points. It can also be explained by multiplying 0.316 points by 100 and then divide the result by 2.669 (standard deviation of corruption perception index) which equals to 12 percent of a standard deviation of CPI.

Table 4.2 Determinants of corruption

Dependent variable: corruption perception index								
	(1) **PLS**	(2) **PLS**	(3) **PLS**	(4) **FE**	(5) **RE**	(6) **PLS**	(7) **PLS**	(8) **GMM**
Log (RGDP)	-1.994*** (0.010)	-1.966*** (0.030)	-0.881*** (0.022)	-0.288 (0.454)	-0.930*** (0.095)	-0.573*** (0.043)	-0.460*** (0.032)	-0.122*** (0.020)
ALR		0.046*** (0.003)	0.028*** (0.002)	-0.026*** (0.008)	0.009 (0.010)	-0.005 (0.003)	0.017*** (0.002)	
LED (Tertiary)		-0.015*** (0.002)	-0.010*** (0.002)	-0.014*** (0.004)	-0.002 (0.002)	-0.014*** (0.001)	-0.006*** (0.001)	
GINI		0.029*** (0.003)	0.040*** (0.003)	0.120*** (0.014)	0.095*** (0.007)	0.051*** (0.003)	0.023*** (0.005)	
UNEM		0.026*** (0.005)	0.013*** (0.005)	0.003 (0.006)	0.013 (0.009)	0.018*** (0.003)	0.013*** (0.005)	
DEMO			0.086*** (0.013)	0.017 (0.018)	-0.018 (0.017)	0.0855*** (0.018)	0.084*** ((0.013)	
EF			-0.751*** (0.021)	-0.099*** (0.018)	-0.172*** (0.028)	-0.621*** (0.016)	-0.671*** (0.020)	
Lag CPI								0.940*** (0.012)
MICs							0.201*** (0.074)	
HICs							-1.601*** (0.084)	
Asia						1.085*** (0.082)		
Latin America						0.606*** (0.10)		
Africa						-0.404*** (0.128)		
Middle East						-0.084 (0.131)		

Table 4.2 continues

	(1) **PLS**	(2) **PLS**	(3) **PLS**	(4) **FE**	(5) **RE**	(6) **PLS**	(7) **PLS**	(8) **GMM**
East Europe						1.709*** (0.122)		
Constant	22.840*** (0.093)	17.602*** (0.305)	12.458*** (0.254)	6.488* (3.935)	9.992*** (0.554)	11.116*** (0.375)	10.388*** (0.319)	1.375*** (0.229)
Adjusted R^2	0.615	0.666	0.757	0.957	0.292	0.811	0.797	0.958
Observations	1000	1000	982	982	1000	982	982	800
Wald test (*P*-value)	0.003	0.003	0.002		0.005	0.006	0.005	
F-statistic				191.110				

Legend: RGDP is real gross domestic product per capita, ALR is adult literacy rate, LED is tertiary level of education, GINI is gini index, UNEM is unemployment rate, DEMO is democracy index which includes political rights, civil liberties, EF is economic freedom index, MICs is middle-income countries and HICs is high-income countries.

White heteroscedasticity corrected standard errors are in parenthesise. ***, **, * indicate significance level at the 1 percent, 5 percent and 10 percent, respectively.

In column (3) institutional variables such as democracy and economic freedom are incorporated to measure the role of these factors on controlling the level of corruption. With the inclusion of institutional variables, all of the other variables retain their signs and significance levels. Except for the Gini coefficient, the magnitude of the other coefficients decreases. One of the most striking results is the direct relationship between democracy and perceived corruption level - the result showing that the coefficient of democracy is positive and significant at the 1 percent level.[31] The positive sign of the democracy coefficient reflects that corruption level increases with an expansion of democracy which is consistent with the generally agreed high levels of corruption in transition countries. Though significant, perhaps the estimate of the impact of democracy is very small. A one standard-deviation increase in the democracy level increases the CPI by 0.288 points, or 11 percent of a standard deviation in the corruption perception index. In other words, an increase in democracy index increases the corruption score by about 0.86 points on a 10-point scale i.e. by about the difference between Slovenia and Spain.[32] This result differs from recent empirical findings of Goldsmith (1999); Sandholtz and Koetzle (2000); Treisman (2000); Montinola and Jackman (2002); Ali and Isse (2003); Sung, (2004); and Bohara et al. (2004). However, the result confirms the findings of Ades and Di Tella (1999), they note that political rights had no significant impact on corruption.

The coefficient of economic freedom confirms the expected negative sign and is significant at the 1 percent level. A one standard-deviation increase in the economic freedom index reduces the CPI by 1.561 points, or 58 percent of a standard deviation in the corruption perception index. The magnitude of the coefficient is much larger when compared with democracy. The result supports the findings of Ades and Di Tella, (1997, 1999); Sandholtz and Koetzle, (2000); and Emerson, (2006) that economic freedom and perceived corruption are negatively related. With the economic

[31] The estimation results fail to find the beneficial effects of democracy on corruption. Noticeably, countries such as Hong Kong and Singapore show the existence of low level of corruption and very low level of democracy. On the other hand, India presents a high level of corruption with a high level of democracy. The result deserves a closer scrutiny and further research to examine the relationship between democracy and corruption.

[32] The democracy coefficient of 0.086 in column (3) multiplied by 10 gives the result equals to 0.86 points.

and social variables, democracy and economic freedom explain more than 75 percent of the variations.

Columns (4) and (5) report the regression results for two-way fixed effects and two-way random effects respectively. The results are very similar to column (3) with few exceptions. Two-way fixed effects result in column (4) shows that the coefficient of log (RGDP) is very small and insignificant. The most interesting result in column (4) is that a higher literacy rate decreases corruption. On the other hand the two-way random effects results confirm that a higher level of income per capita reduces corruption and the result is significant at the 1 percent level. Random effects results also show that the level of democracy reduces corruption although the coefficient is not significant. For comparing the fixed effects and the random effects results, the Hausman test is used. Following Wooldridge (2009, p. 493), random effects should be used unless the Hausman test rejects the null hypothesis that the random effect is not mis-specified. The estimated statistic provides little evidence against null hypothesis which suggests that random effects are more appropriate to tackle the problem of corruption noted in equation (4.1).[33]

Column (6) shows the regression results across regions based on equation (4.2).[34] The estimated results of the regional dummy variables indicate higher levels of corruption in Asia, East Europe and Latin America. The estimated coefficients of these regional dummies are all positive and significant at the 1 percent level. In particular, the result is crucial for Asia and East European countries as the coefficients are substantially larger for these two regions. The results clearly indicate that the problem of corruption is more serious in Asia and East European countries, compared to other regions. Interestingly, it is noted that the estimated coefficient of Africa is negative and highly significant at the 1 percent level. Examination of TI's CPI scores confirms that Africa, Asia, Eastern Europe, Latin America and the Middle East countries are all perceived to be more corrupt than the Organisation for Economic Co-operation and Economic Development (OECD) countries. The estimation results of the regional dummies, excluding the control variables, show that African countries are perceived to be

[33] The estimated value is 0.834 which is below 0.10, implying that random effect should be used.
[34] Inclusion of regional dummies tries to control for the combined impact of various region specific factors on the dependent variable.

significantly more corrupt than Asia, Latin America, Middle East and the OECD countries. However, after controlling for economic development, only Asia and East European countries remain more corrupt than OECD countries.[35] The results obtained in column (6) for the socio-economic and institutional variables are similar to the estimated results in columns (1), (2) and (3), except for the sign of the coefficient of the literacy rate which is negative and insignificant. The result suggests that in developing countries improved literacy helps to reduce corruption level.

Based on the estimated equation (4.3) by income classification, column (7) reports the results for middle-income countries (MICs) and high-income countries (HICs) groups in comparison to that of low income countries (LICs).[36] The coefficient of HICs has the expected negative sign, whereas the coefficient of MICs is positive, and both coefficients are significant at the 1 percent level.[37] Interestingly, column (7) depicts some mixed results. On the one hand, the negative coefficient of HICs indicates that there is a strong correlation between economic development and perceived corruption, i.e. high-income countries are perceived to be less corrupt than low-income countries. On the other hand, the positive coefficient of MICs demonstrates that the middle-income countries are perceived to be more corrupt than low-income countries when economic development of the countries is controlled. The result raises the question about the linear relationship between income per capita and corruption.

Finally, column (8) represents the impact of previous year's corruption on the current level. The result shows a positive and statistically significant relationship between previous year and the current level of corruption. In other words, previous year corruption increases the current level of corruption significantly. The lagged perceived corruption indices explain most of the variation in the current period perceived

[35]Estimation results are reported in the Appendix Table A4.9.

[36] The LICs, MICs and HICs are based on World Bank classification of countries by income group. For details see *World Development Indicators*, World Bank (2005). In 2003, low-income economies are those with a Gross National Income (GNI) per capita of $765 or less in 2003. Middle-income economies are those with a GNI per capita of more than $765 but less than $9,386 and high-income economies are those with a GNI per capita of $9,386 or more. In 1997, the income of LICs, MICs and HICs are specified as GNI per capita income of $755 or less, $756-9265 and 9266 or more, respectively. All countries remain in the same group during 1995-2004. The list of LICs, MICs and HICs are presented in Appendix Table A4.10.

[37] The estimation result for two income group dummies without controls shows that both MICs and HICs are perceived to be less corrupt than LICs.

corruption level. The adjusted R^2 compared to column (1) increases sharply from 0.62 to 0.96 indicating that the initial value of corruption substantially improves the fit of the regression. The results indicate that corruption persists at least in the short-run to medium-run. In addition, despite a decrease in magnitude, real GDP per capita remains significant in reducing corruption even in the presence of lagged corruption.

Overall, the results presented in Table 4.2 show that there is a strong negative relationship between real GDP per capita and corruption; it is robust and remains significant with various specifications. It signifies that rich countries are perceived to be less corrupt than the poor nations. After including various control variables, the absolute value of the coefficient of log (RGDP) varies from 0.122 to 1.994. This means that a 10-fold increase in per capita real GDP – say from that of Bangladesh to that of Venezuela - would lead to a drop in CPI score between 0.122 and 1.994 points – which would bring Bangladesh up to somewhere around the corruption level of Albania or Russia. The variable log real GDP per capita by itself explains more than three-fifths of the variation in the corruption levels between countries in the sample. However, the result (after controlling for economic development and political systems) reflects that African countries are less corrupt than OECD countries, and that middle-income countries are more corrupt than the low-income group. These results provide evidence against the simple linear relationship between real GDP per capita and corruption.[38] In other words, we should be cautious about the idea that, if a country simply moves up (down) in the ranks of income per capita, it is also moved down (up) in the ranks of CPI score. To examine the results, by income classification, of countries the next section analyses the relationship between real GDP per capita and corruption separately for LICs, MICs and HICs.

4.4.2 The per capita income and corruption relationship in LICs, MICs and HICs

In order to assess the empirical relevance of the relationship between real GDP per capita and corruption, this study re-estimates equation (4.1) for each group of countries

[38] Inspection of raw data does not provide a simple negative relationship between income per capita and the level of corruption, i.e. there are some countries with high levels of corruption, however, their income levels are quite high compared to the countries with relatively low levels of corruption.

using PLS estimation method for the period 1995-2004.[39] The estimation results are presented in Table 4.3.

Column (9) shows the estimates of the base specification for low-income countries. The sign of the coefficient of log (RGDP) is positive and significant at the 10 percent level. The positive sign indicates that the level of corruption increases with income. The result supports the evidence presented in column (6) and (7) (Table 4.2) that African nations and low-income group of countries are less corrupt. The coefficients of other economic variables retain the expected signs and significance at the conventional levels, although the magnitudes of the coefficients are very small. It is worthwhile to note that the sign of the democracy index is negative and highly significant. This indicates that greater democracy lowers corruption in low-income countries.

Columns (10) and (11) show the results for the middle-income and the high-income groups respectively. The coefficient of log (RGDP) is significant, and of the expected negative sign for both MICs and HICs. The magnitude of the coefficient is far greater for the high income group, suggesting that a higher level of income of the developed countries reduces corruption significantly and to a greater degree. This means that a 105 percent increase in per capita real GDP– say from Kuwait's income to that of the United Kingdom - would lead to a drop in CPI score by approximately 1.48 points – which would bring Kuwait up to somewhere around the level of corruption in Chile (where Chile's corruption level is higher than the UK).[40] Figure 4.1 shows the scatter plots of the linear relationship between real GDP per capita and corruption for LICs, MICs and HICs. The negative relationship is evident for the middle-income and high-income groups of countries and the slope of the regression line is relatively steeper for the high-income group. However, findings on the low-income countries do not support a negative linear relationship between the level of income and corruption.

[39]The study repeats the same estimation using OLS and the results are consistent with the PLS estimation results.

[40] Δ Corruption level = (1.409 (coefficient of log RGDP in column (9)) /100) * 105 (% Δ RGDP) = 1.48

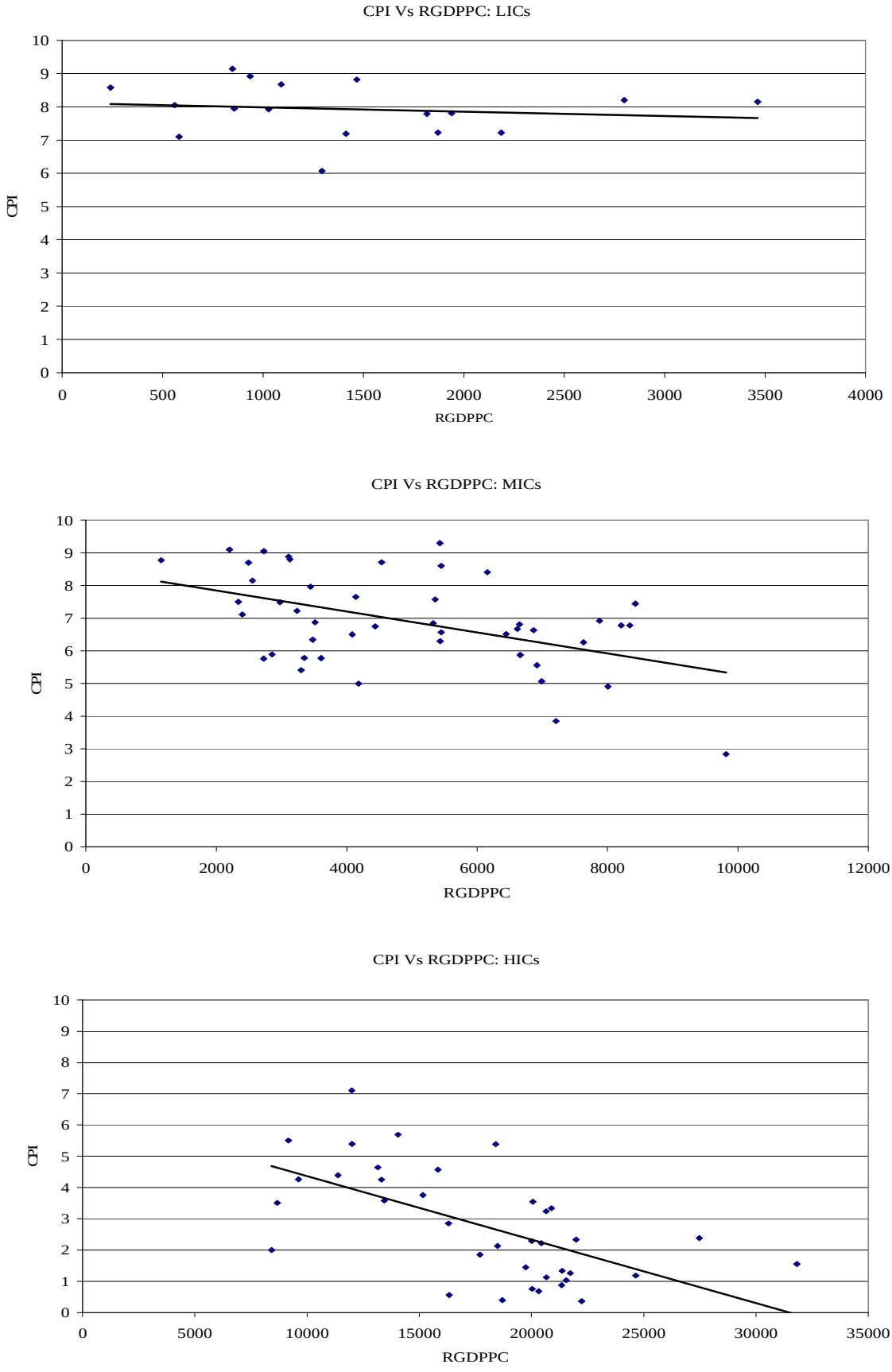
Table 4.3 The RGDP per capita and corruption relationship in LICs, MICs and HICs

	(9) **LICs**	(10) **MICs**	(11) **HICs**
Log (RGDP)	0.142* (0.074)	-0.728*** (0.084)	-1.409*** (0.245)
ALR	0.004** (0.002)	0.038*** (0.002)	0.056*** (0.012)
LED (Tertiary)	-0.016* (0.009)	0.003 (0.003)	-0.023*** (0.003)
GINI	0.051*** (0.012)	-0.005 (0.004)	0.114*** (0.005)
UNEM	0.016*** (0.003)	0.009 (0.008)	0.006 (0.009)
DEMO	-0.068*** (0.019)	-0.031 (0.024)	0.210*** (0.020)
EF	-0.134*** (0.049)	-0.544*** (0.036)	-0.795*** (0.073)
Constant	4.817*** (0.969)	11.667*** (0.837)	12.072*** (1.344)
Adjusted R^2	0.263	0.572	0.576
Observations	170	480	350
Wald test (*p*-value)	0.002	0.001	0.006

Note: LICs is low-income countries, MICs is middle-income countries and HICs is high-income countries. For legends see Table 4.2.
White heteroscedasticity corrected standard errors are in parenthesise. ***, **, * indicate significance level at the 1 percent, 5 percent and 10 percent, respectively.

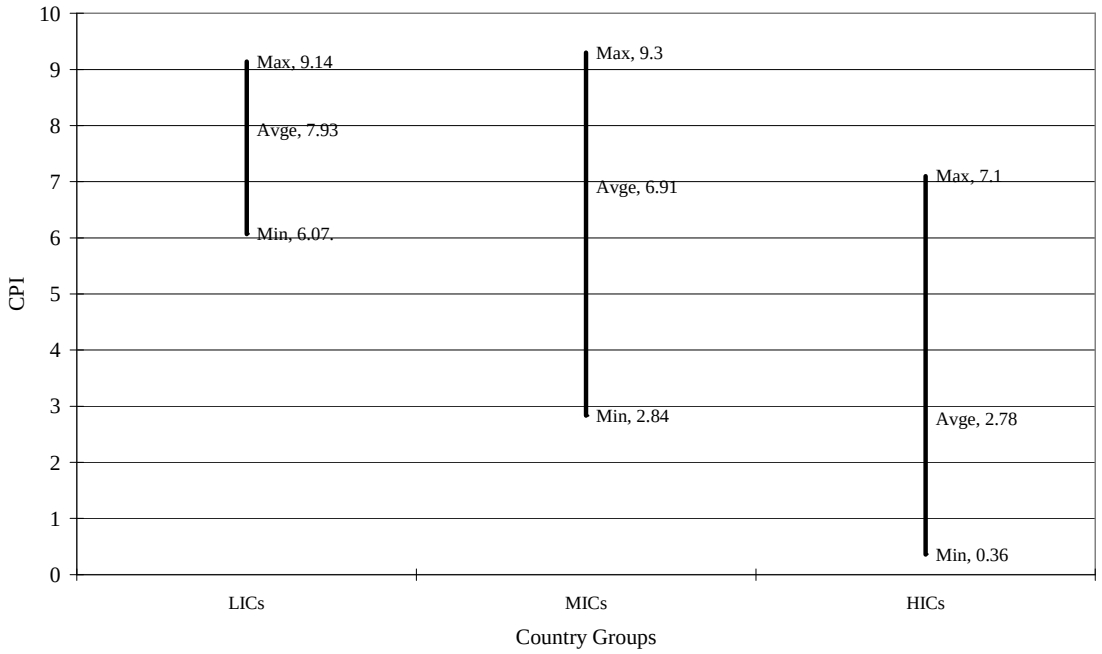
Inspection of the range of the CPI values for the LICs, MICs and HICs suggests that the maximum CPI score for the MICs is greater than the maximum CPI score of the LICs (Figure 4.2). Moreover, the range of the CPI score is higher for the MICs and HICs. Furthermore, the minimum CPI score of LICs is far greater than MICs and HICs. This evidence helps to explain that low-income countries do not generate sufficient income to control the high level of corruption. In addition, a small increase in income does not inflate the cost of being corrupt which in turn reduces the level of corruption. Even an increase in income increases the opportunity of further corruption. The results suggest that there is a possibility of a non-linear relationship between the level of income and corruption. In other words, in the early stages of economic development an increase in income encourages corruption whereas in the mature stages of economic growth and development an increase in income reduces the level of corruption.

Figure 4.1 RGDP per capita and CPI for LICs, MICs and HICs



Note: RGDP is real GDP, CPI is corruption perception index, LICs is low-income countries, MICs is middle-income countries and HICs is high-income countries.

Figure 4.2 Range of CPI in LICs, MICs and HICs



Note: CPI is corruption perception index, LICs is low-income countries, MICs is middle-income countries and HICs is high-income countries.

The next subsection estimates the relationship between corruption and real GDP per capita, in a non-linear framework.

4.4.3 Real GDP per capita and corruption: non-linear estimation

The above results find evidence that an increase in per capita income increases corruption in low income countries and it reduces corruption in high income countries. The result suggests that a non-linear relationship may exist between per capita income and corruption. The scatter plots in Figure 4.3 below, illustrate the close relationship between real GDP per capita and corruption with the best fitted Kernel curves. It is evident that there exists a non-linear relationship between real GDP per capita and corruption.

To evaluate the possibility of a non-linear relationship between per capita income and the level of corruption more systematically, the study re-estimates the model based on a non-linear framework of quadratic form depicted in equation (4.4) for the LICs, MICs, HICs, and for all countries in the sample. The non-linear relationship between income per capita and corruption are represented by the linear and squared term of log

real GDP per capita of a second degree polynomial function in equation (4.4). The PLS estimation results of the quadratic function are displayed in Table 4.4.

Column (12) presents the non-linear estimation results for all countries whereas columns (13), (14) and (15) show the results for LICs, MICs and HICs, respectively, for the period 1995-2004. The results confirm the existence of a non-linear Kuznets relationship between real GDP per capita and corruption. The inverted-U-shaped Kuznets relationship states that the corruption level increases initially but then reduces in the course of a country's economic development.[41] The estimated correlation value between CPI and log (RGDP)-of 6.243 on the linear term is positive and is a negative value of 0.443 on the squared term for all countries. The coefficients are statistically significant at the conventional level except for the low income countries. In addition, the inclusion of the second-order polynomial term improves the model's goodness of fit for the MICs, HICs and for all country cases. The estimated negative sign for the second-degree polynomial of log (RGDP) reveals that a concave function better fits the data than the simple linear and cubic functions.[42] The calculated adjusted R^2 improves most for the high income countries (the adjusted R^2 changes from 0.576 to 0.597 (see Table 4.4 column (15)) for HICs).

Table 4.4 Non-linear relationship between per capita income and corruption

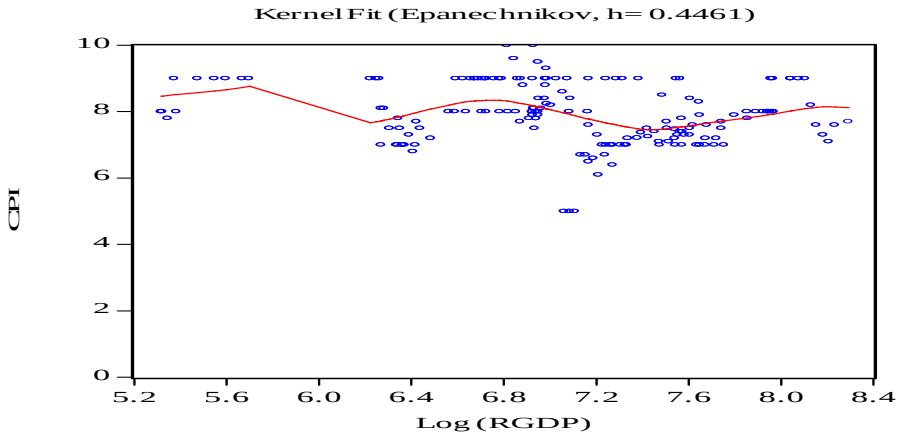
	(12) **All countries**	(13) **LICs**	(14) **MICs**	(15) **HICs**
Log (RGDP)	6.243*** (0.585)	1.129 (1.402)	4.690** (2.438)	28.676*** (8.363)
[Log (RGDP)]^2	-0.443*** (0.036)	-0.073 (0.107)	-0.324** (0.149)	-1.590*** (0.434)
Adjusted R^2	0.797	0.260	0.551	0.597
Observations	982	170	480	350
Wald test (*p*-value)	0.001	0.004	0.006	0.006

Note: CPI is corruption perception index, LICs is low-income countries, MICs is middle-income countries and HICs is high-income countries.
All equations control for adult literacy rate, level of education, income inequality, unemployment rate, democracy and economic freedom. White heteroscedasticity corrected standard errors are in parenthesise. ***, **, * indicate significance level at the 1 percent, 5 percent and 10 percent respectively.

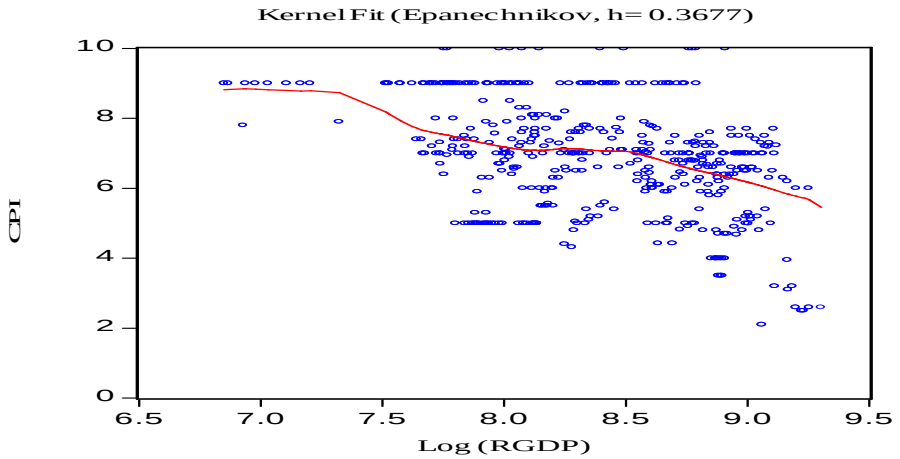
[41] See Kuznets (1955) for details.
[42] The second degree non-linear function illustrates the non-monotonicity of per capita income and corruption well. As the cubic function of log real GDP per capita decreases the R^2 value of the regression.

Figure 4.3 Kernel fit plots of log (RGDP) and corruption for LICs, MICs and HICs

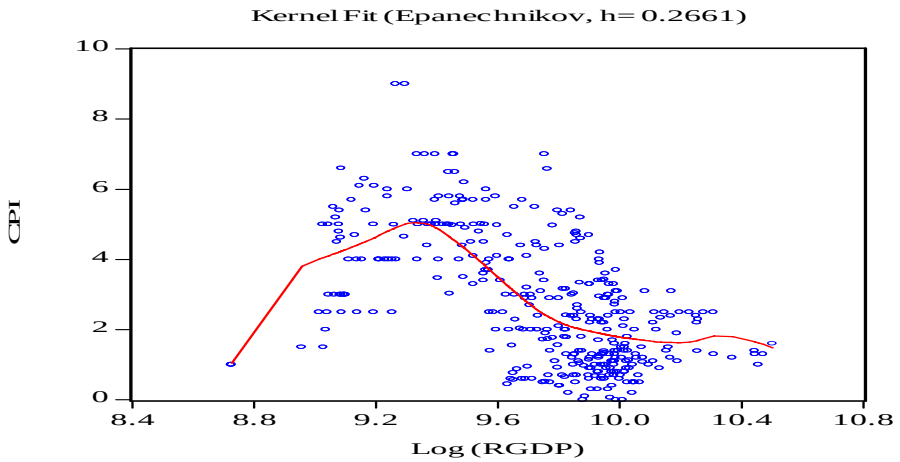
LICs



MICs



HICs



Note: RGDP is real gross domestic product per capita, LICs is low-income countries, MICs is middle-income countries and HICs is high-income countries.

The evidence of low-income, middle-income and high-income countries provides support for a non-linear relationship between per capita income and corruption level. The turning points are estimated, based on equation (4.3) for the LICs, MICs, HICs and for all countries at which the relationship switches from positive to negative, shown in Table 4.5. The turning point for all countries in the sample, LICs and MICs, is approximately at its value of 7, whereas the turning point for HICs is 9. The result suggests that poor countries with an extremely low level of income exhibit a high level of corruption in the early stages of economic development, and the corruption level increases until they reach the turning point at which the average level of corruption is at its maximum; once past the turning point, corruption level tends to become substantially lower at more mature stages of development with a high level of income.

Table 4.5 Turning points of the real GDP per capita

	All Country	**LICs**	**MICs**	**HICs**
Turning point	7.046275	7.732877	7.237654	9.01761
RGDP at the turning point	1147.734	2280.329	1389.784	8239.336

Note: CPI is corruption perception index, LICs is low-income countries, MICs is middle-income countries and HICs is high-income countries.

Table 4.5 also displays the value of real GDP per capita at each of the turning points where corruption level starts decreasing for all countries, LICs, MICs and HICs. It is seen that the value of real GDP per capita at the turning point for high income countries becomes $8239.336 (1990 U.S. dollars), which is quite high in comparison with the income levels of LICs and MICs. The RGDP values of MICs suggests that few middle income countries already achieve the required levels of income of HICs to break the turning point but the average real GDP per capita of $1434.60 (1990 U.S. dollars) of LICs illustrates that low income countries are far behind the required levels of income for corruption to decrease. Furthermore, the average incomes levels of high-income countries are above the turning point level of income, which demonstrates that high-income countries have already reached the required level of development and, therefore, experience low levels of corruption.

Overall, the non-linear relationship between real GDP per capita and corruption is quite evident in HICs. The higher stages of economic development make it possible for the HICs to pay higher compensation to bureaucrats, which in turn helps to deter

corruption.[43] Transparency International's corruption perception index 2004 supports the theoretical expectations about the correlations among corruption and income. It is observed that the countries possessing well developed and highly integrated economies are among the least corrupt. Nations that fall into this situation include Denmark, Finland, Iceland, Canada, New Zealand, and Sweden. On the other hand, the most corrupt countries are traditionally viewed as having less developed and less integrated economies. Examples of some of the most corrupt nations include Bangladesh, Indonesia, Kenya, and Nigeria.

4.5 Sensitivity Analysis

The preceding section has shown the results of testing the various hypotheses to explain the levels of variation in corruption - in particular, the relationship between real GDP per capita and the degree of corruption across regions and countries. To check the robustness of the results, this section re-estimates the basic regression for the cross-section analysis and the results are discussed in the subsection 4.5.1. In addition, the two-stage least square methods are used to test the existence of endogeneity bias (subsection 4.5.2). An alternative measure of corruption is also utilised in both the cases.

4.5.1 Cross-section estimations

This subsection presents the results of the ordinary least square (OLS) analysis testing the variations of corruption, using 10-year average of the period 1995-2004, as well as the single year data for 1995 and 2004. The OLS regression results are reported in Table 4.6.

Columns (16) and (17) estimate the average values of the data for the dependent and independent variables shown in columns (1) and (2) of Table 4.2, and columns (16)-(18) estimate the base equation (1) for the average period and the single year 1995 and 2004 respectively. Imports of goods and services as a percentage share of GDP, protestant tradition and British colony are incorporated in the OLS estimation shown in columns (17)–(21).The results show that log (RGDP) is negative and significant at the

[43] The result confirms the businessman's approach to control corruption by paying higher wages to bureaucrats. See Ades and Di Tella (1997, p. 497).

1 percent level. The signs of other coefficients are consistent with the panel estimation results except that the sign of the coefficient of UNEM is negative in column (19). The log (RGDP) and economic freedom indices retain the significance level throughout the estimations; however, literacy rate, the level of education, unemployment and democracy lose their significance levels with a few exceptions. The coefficient of imports of goods and services as a percentage of GDP is positive except in column (17) although it is insignificant. The result shows that a higher level of import increases corruption which is not consistent with the findings of Treisman (2000). The coefficient of percent protestant is negative and significant at the 1 percent level suggesting that protestant traditions reduce level of corruption of a country significantly. The negative coefficient of former British colony indicates that countries with histories of British rule are less corrupt. These findings confirm the result of Treisman (2000).

For the same dependent variable (CPI), the estimated coefficients for democracy and economic freedom indices always become larger in magnitude and highly significant, whereas those for real GDP per capita always decrease when the average data of the variables are used instead of the single-year data (columns (18)-(20)). For CPI 1995 and 2004, the magnitude of the estimated coefficients for democracy, it increases from 0.074 in 1995 and 0.054 in 2004 to 0.163, and for economic freedom increases from 0.704 in 1995 and 0.632 in 2004 to 0.954, whereas the estimate for real per capita GDP decreases from 0.822 in 1995 and 0.886 in 2004 to 0.753 as we switch from single year to average data. The result suggests that OLS estimates for single-year data are biased upward for real GDP per capita, and towards zero for democracy and economic freedom indices as the latter two variables may contain larger measurement errors. The result is consistent with the findings of You and Khagram (2005).

Column (21) estimates the average data of the independent variables with average World Bank control of corruption index (CCI) as the dependent variable to check the robustness of the results. Except unemployment rate the estimated coefficients of the economic and social variables retain the expected signs and significance levels; the magnitude of the coefficients also remains very close to the estimated results in column (18), where TI's CPI is the dependent variable. The coefficients for democracy

and economic freedom variables vary depending on whether CPI or CCI is used as the dependent variable. A higher index of economic freedom increases control of corruption, and it is significant at the 1 percent level, although the magnitude of the coefficient is quite small. A higher democracy level raises the control of corruption, but the estimated coefficient is insignificant and small in magnitude. Also, the magnitude of the coefficients of former British colony and protestant tradition decreases when CCI is used instead of CPI. On the other, the coefficient of imports share of GDP is positive reflecting that a higher level of import increases control of corruption.

Table 4.6 Determinants of corruption: OLS estimation

Dependent variable: CPI in columns (16)-(20) and CCI in column (21)						
	(16) **Avg. 1995-2004**	(17) **Avg. 1995-2004**	(18) **Avg. 1995-2004**	(19) **1995**	(20) **2004**	(21) **Avg. 1996-2004**
Log (RGDP)	-2.009*** (0.175)	-1.938*** (0.269)	-0.753*** (0.242)	-0.822*** (0.319)	-0.886*** (0.254)	0.869*** (0.178)
ALR		0.040*** (0.013)	0.014 (0.011)	0.014 (0013)	0.0003 (0.011)	-0.022** (0.010)
LED (Tertiary)		-0.011 (0.012)	-0.004 (0.009)	-0.010 (0.014)	-0.003 (0.009)	0.006 (0.007)
GINI		0.013 (0.018)	0.030** (0.015)	0.048** (0.023)	0.030* (0.016)	-0.032*** (0.013)
UNEM		0.019 (0.020)	0.005 (0.014)	-0.003 (0.020)	0.023 (0.015)	0.003 (0.011)
(Imports/GDP) (%)		-0.001 (0.006)	0.007 (0.005)	0.012 (0.008)	0.003 (0.005)	0.001 (0.005)
Percent Protestant		-2.223*** (0.531)	-1.710*** (0.550)	-1.541*** (0.508)	-1.811*** (0.576)	0.977* 90.569
British Colony		-0.863*** (0.331)	-0.360 (0.268)	-0.402 (0.387)	-0.638** (0.294)	0.345* (0.208)
DEMO			0.163*** (0.057)	0.074 (0.088)	0.054 (0.063)	0.065 (0.041)
EF			-0.954*** (0.119)	-0.704*** (0.135)	-0.632*** (0.141)	0.527*** (0.093)
Constant	22.977*** (1.533)	18.837*** (2.606)	13.317*** (2.053)	12.378*** (3.058)	14.653*** (2.116)	-2.796* (1.646)
Adjusted R^2	0.643	0.725	0.833	0.721	0.788	0.856
Observations	100	98	97	92	95	97
Serial Correlation test (*P*-value)	0.864	0.623	0.996			0.911
Normality test (*P*-value)	0.454	0.914	0.418	0.626	0.263	0.197
Heteroskedasticity test (*P*-value)	0.776	0.939	0.792			0.356

Note: CPI is corruption perception index and CCI is control of corruption index. For legend see Table 4.2.

White heteroscedasticity corrected standard errors are in parenthesise. ***, **, * indicate significance level at the 1 percent, 5 percent and 10 percent, respectively.

It is worth noting that the coefficients of real GDP per capita and economic freedom are highly significant, irrespective of the average and single-year data and of the corruption measures. In all cases economic freedom indices and real GDP per capita have the expected sign, and are significant at the 1 percent level. Moreover, the magnitude of the coefficient for the average estimations for real GDP per capita does not differ to any greater extent with the use of alternative corruption measures. The coefficients for log (RGDP) are -0.75 with CPI as dependent variable over; and 0.87 for CCI in the period 1996-2004. Furthermore, the 1995 and 2004 single-year estimation results in columns (19) and (20) suggest that the level of per capita real GDP, imports of goods and services as a percentage of GDP and British colony have a stronger effect in controlling corruption in 2004 than 1995. On the other hand, the positive effect of income inequality on corruption is quite small in 2004; whereas economic freedom has a larger effect in combating corruption significantly in 1995 relative to 2004.

4.5.2 Two-stage estimations

The previous section shows that a significant partial correlation between income per capita and corruption exists, along with other socio-economic, religious, British colonial history and institutional control variables. The next step use the instrumental variables (IV) method to provide better evidence of a causal influence from income per capita to corruption to obtain better unbiased estimates for the effect of real GDP per capita on corruption.

We begin from the simplest IV regressions in which only real GDP per capita is instrumented:

$$CPI_i = \beta_0 + \beta_1 \log (RGDP)_i + \beta_2 X_i + \varepsilon_i \quad (4.5)$$

$$\log (RGDP)_i = \gamma_0 + \gamma_1 INFM_i + \gamma_2 SAN_i + \gamma_3 X_i + \upsilon_i \quad (4.6)$$

where X denotes covariates, i is country and ε and υ are the random error terms.

The OLS estimates for β_1 can be biased because of reverse causality from corruption to income per capita. Good instrumental variables can correct for the potential biases.

Thus, real GDP per capita is instrumented with infant mortality rate (INFM) and clean sanitation (SAN). We control for the other variables as infant mortality rate and clean sanitation might be correlated with other independent variables in the analysis. The two-stage least square estimation results are reported in Table 4.7.

Table 4.7 Two-stage least square regression results for CPI and CCI

	(22)	(23)	(24)	(25) (CCI)
Log (RGDP)	-1.723*** (0.176)	-1.481*** (0.397)	-0.378 (0.375)	0.515** (0.265)
ALR		0.038*** (0.013)	0.009 (0.011)	-0.018* (0.010)
LED (Tertiary)		-0.022 (0.015)	-0.009 (0.011)	0.010 (0.008)
GINI		0.024 (0.020)	0.038** (0.016)	-0.039*** (0.015)
UNEM		0.031 (0.020)	0.009 (0.014)	-0.001 (0.012)
(Imports/GDP) (%)		-004 (0.006)	0.007 (0.005)	0.001 (0.005)
Percent Protestant		-2.209 (0.557)	-1.635*** (0.577)	0.907 (0.595)
British Colony		-0.906*** (0.335)	-0.313 (0.285)	0.301 (0.213)
DEMO			0.181*** (0.056)	0.037 (0.046)
EF			-1.074*** (0.147)	0.679*** (0.110)
Constant	20.503*** (1.505)	15.038*** (3.598)	10.739*** (2.914)	-0.365 (2.286)
Adjusted R^2	0.629	0.713	0.828	0.844
Observations	100	98	97	97
Number of instruments	2	9	11	11
p-value (overidentification test)	0.783	0.933	0.956	0.979

Note: CPI is corruption perception index and CCI is control of corruption index. For legend see Table 4.2.
White heteroscedasticity corrected standard errors are in parenthesise. ***, **, * indicate significance level at the 1 percent, 5 percent and 10 percent, respectively.

Hence, IV estimation, both with and without controls are tested to compare the results with those of the OLS regressions. The two-stage-least-square (2SLS) estimated coefficients for log (RGDP) in Table 4.8 (columns (22)-(24)) are much smaller than their corresponding OLS estimates (see Table 4.6), both with and without controls. Without controls, the magnitude of the coefficient for log (RGDP) decreases from 2.009 in column (16) to 1.723 in column (22). With the same set of controls as for columns (17) and (18), the magnitude of the coefficient for log (RGDP) decreases from

1.938 to 1.481 in column (23), and 0.753 to 0.378 in column (24) for 2SLS. The real GDP per capita is significant at the 1 percent level in columns (22) and (23). These probably are the best estimates of the causal effect that real GDP per capita has on corruption. However, log (RGDP) is not significant when democracy and economic freedom indices are included with other controls. In column (25) log (RGDP) is significant and increases control of corruption when CCI is used as a dependent variable.

4.6 Conclusion

This chapter presents an empirical analysis of the causes of corruption across countries. The various hypotheses examined in the study suggest that real per capita GDP, education, unemployment, income inequality, economic freedom and democracy are among the factors that determine the cross-country differences in corruption. Corruption is found to be negatively and significantly correlated with real per capita GDP, level of tertiary education and economic freedom. These factors suggest that corruption decreases as countries become developed where higher education and economic freedom reduce corruption levels. In contrast, corruption rises significantly with a higher income inequality, unemployment, and literacy rate; however, interestingly an expansion of democracy also increases corruption. Except for literacy rate and democracy level, all the proposed hypotheses are confirmed in the analysis. Together these variables account for more than 75 percent of the variation in the level of corruption. Both panel estimation and cross-section analysis find consistent results which support various hypotheses proposed in this chapter.

In addition, the results find that the protestant tradition and former British colony reduce the level of corruption significantly which is consistent with Treisman (2000). Imports of goods and services as a percentage of GDP though not always significant, is found to be positively correlated with corruption, indicating that a higher level of import increases the level of corruption. The study also finds that corruption is lower in developed countries where high levels of economic development produces higher levels of income. Increased incomes are capable enough in restraining corruption level significantly. Corruption data from two different sources confirms the results. The relationship is robust in controlling for endogeneity by using infant mortality rate and

clean sanitation as instruments. There is evidence that low levels of real GDP per capita cause high levels of corruption and the significant lagged corruption coefficient indicates that corruption persists at least in the short and medium term.

The results for regional dummies and countries by income groups provide some vital implications. The observed low level of corruption in African countries and high level of corruption in the middle-income countries after controlling for economic development, attract attention and challenge the linear relationship between per capita income and corruption. Examination of the non-linear relationship between real GDP per capita and corruption finds that a small increase in income at a lower level of economic development increases the opportunity for corruption. Accordingly, an increase in income increases the level of corruption, once past the threshold level of income however, corruption level decreases substantially through high level of economic development. This relationship is robust under various estimation methodologies and for various control variables.

A crucial result of the analysis is the effect of democracy on corruption. Throughout the study the coefficient of democracy is positive and highly significant for CPI measures. The existing literature on the relationship between democracy and corruption produces some mixed results. Some studies also find the non-linearity between democracy and corruption. Keeping in mind all the differing results, it is crucial to study the relationship between democracy and corruption more rigorously. The next chapter will analyse the relationship in a theoretical framework and Chapter 6 examines the relationship empirically.

APPENDIX 4

This Appendix consists of ten tables. Table A4.1 summarises the descriptive statistics of the variables. Table A4.2 presents data sources and the list of countries included in the study is shown in Table A4.3. Table A4.4 presents the Anova table of the corruption perception index for the period 1995-2004. Table A4.5 – Table A4.7 presents the estimation results based on various econometric technique of the base models presented in Table 4.2. Table A4.8 reports the estimation results of the relationship between infant mortality rate and clean sanitation with per capita income and Table A4.9 presents the relationship between corruption and regional dummies without control variables. Table A4.10 presents the list of countries by income classification.

Appendix Table A4.1 Descriptive statistics of the variables

	Mean	Median	Maximum	Minimum	Standard Deviation	Observations
ALR	87.812	95.74	100	33.59	16.311	1000
CPI	5.553	6.3	10	0	2.6693	1000
DEMO	3.938	3.33	10	0	3.3526	1000
EF	5.173	5.13	10	0.725	2.0791	1000
GINI	38.557	37.55	63.7	20	8.9703	1000
LED	31.408	27.75	89.5	0	21.037	1000
RGDP	9102.44	6463	36341	204	7702.2	1000
UNEM	12.254	9.25	42	0.4	9.8467	1000

Legend: ALR is adult literacy rate, CPI is corruption perception index, DEMO is democracy index which includes political rights and civil liberties, EF is economic freedom index, GINI is gini index, LED is tertiary level of education, RGDP is real gross domestic product per capita and UNEM is unemployment rate.

Appendix Table A4.2 Data sources

Variables	Data Source
Corruption Perceptions Index (CPI)	Transparency International http://www.transparency.org/policy_research/surveys_indices/cpi.
Real GDP Per Capita (1990 US dollars) (RGDP)	Groningen Growth and Development Centre http://www.ggdc.net/index-dseries.html.
Gini Coefficient (GINI)	WIDER World Income Inequality Database http://www.wider.unu.edu/wiid/wiid.htm.
Unemployment Rate (UNEM)	Political Risk Year Book, Political Risk Services, The PRS Group, Inc., 2005. http://www.prsgroup.com/
Level of Education (tertiary), Gross Enrollment Ratio (LED)	World Bank (2005) World Development Indicators.
Adult Literacy Rate (ALR)	World Bank (2005) World Development Indicators.
Democracy Index (DEMO)	Freedom House http://www.freedomhouse.org/uploads/fiw/FIWAllScores.xls.
Economic Freedom (EF)	The Heritage Foundation http://www.heritage.org/index/ , 2006.
Low-income countries (LICs)	World Bank (2005) World Development Indicators.
Middle-income countries (MICs)	World Bank (2005) World Development Indicators.
High-income countries (HICs)	World Bank (2005) World Development Indicators.
(Imports/GDP) (%)	World Bank (2005) World Development Indicators.
British Colony	Treisman (2005).
Percent Protestant	La Porta et al. (1998).

Appendix Table A4.3 List of countries included in the analysis

Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Bosnia, Brazil, Bulgaria, Canada, Chile, China, Colombia Congo Democratic Republic, Cote d' Ivore, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Estonia, Ethiopia, Finland, France, Georgia, Germany, Ghana, Greece, Guatemala, Hong Kong Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Japan, Jordon, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lithuania, Luxemburg, Macedonia, Malaysia, Malta, Mexico, Moldova, Morocco, Myanmar, Netherlands, New Zealand, Nigeria, Norway, Oman, Pakistan, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Turkey Turkmenistan, Ukraine, United Arab Emirates, United Kingdom, United States, Uzbekistan, Venezuela, Vietnam and Yemen.

Appendix Table A4.4 Anova list

Source of Variation	***SS***	***Df***	***MS***	***F***	***P-value***	***Critical F value***
Between Groups	6790.524	99	68.591	188.415	0.00	1.263
Within Groups	327.638	900	0.364			
Total	7118.162	999				

Note: *SS* is sum of squares, *Df* is degrees of freedom, *MS* is mean squares, *F* is *F* statistic value, *P-value* is probability value and *F value* is critical value of *F* distribution.

Table A4.5 Determinants of corruption: white period standard error corrected

Dependent variable: corruption perception index						
	(1) **PLS**	(2) **PLS**	(3) **PLS**	(4) **PLS**	(5) **PLS**	(6) **GMM**
Log (RGDP)	-1.994*** (0.171)	-1.966*** (0.254)	-0.881*** (0.225)	-0.585** (0.266)	-0.460** (0.231)	-0.163*** (0.036)
ALR		0.0458*** (0.011)	0.028*** (0.009)	-0.006 (0.009)	0.017** (0.007)	
LED (Tertiary)		-0.015 (0.010)	-0.010 (0.009)	-0.011 (0.008)	-0.006 (0.009)	
GINI		0.029* (0.017)	0.040*** (0.015)	0.052*** (0.015)	0.023 (0.015)	
UNEM		0.026 (0.019)	0.013 (0.014)	0.019* (0.011)	0.013 (0.012)	
DEMO			0.086* (0.049)	0.084 (0.057)	0.084* ((0.049)	
EF			-0.751*** (0.083)	-0.610*** (0.109)	-0.671*** (0.084)	
Lag CPI						0.918*** (0.014)
MICs					0.201 (0.034)	
HICs					-1.601** (0.670)	
Asia				1.145*** (0.422)		
Latin America				0.644 (0.518)		
Africa				-0.335*** (0.469)		
Middle East				-0.017 (0.426)		
East Europe				1.754*** (0.364)		
Constant	22.840*** (1.491)	17.602*** (2.445)	12.458*** (1.927)	11.037*** (2.291)	10.388*** (1.965)	1.840*** (0.390)
Adjusted R^2	0.615	0.666	0.757	0.809	0.797	0.958
Observations	1000	1000	982	982	982	900
Wald test (*P*-value)	0.000	0.000	0.000	0.000	0.000	

White heteroscedasticity corrected standard errors are in parenthesise. ***, **, * indicate significance level at the 1 percent, 5 percent and 10 percent, respectively. For legends see Appendix Table A4.1

Table A4.6 Determinants of corruption: *generalised* least square (cross-section weights)

Dependent variable: corruption perception index						
	(1) **PLS**	(2) **PLS**	(3) **PLS**	(4) **PLS**	(5) **PLS**	(6) **GMM**
Log (RGDP)	-1.982*** (0.23)	-2.077*** (0.049)	-0.872*** (0.046)	-0.491*** (0.070)	-0.529*** (0.051)	-0.093*** (0.007)
ALR		0.047*** (0.002)	0.032*** (0.002)	-0.010*** (0.003)	0.021*** (0.002)	
LED (Tertiary)		-0.010*** (0.002)	-0.011*** (0.002)	-0.009*** (0.002)	-0.003* (0.002)	
GINI		0.029*** (0.003)	0.049*** (0.003)	0.060*** (0.004)	0.028*** (0.003)	
UNEM		0.025*** (0.004)	0.017*** (0.003)	0.017*** (0.003)	0.020*** (0.003)	
DEMO			0.071*** (0.011)	0.041*** (0.015)	0.084*** ((0.009)	
EF			-0.734*** (0.019)	-0.559*** (0.029)	-0.633*** (0.020)	
Lag CPI						0.957*** (0.007)
MICs					0.284*** (0.087)	
HICs					-1.583** (0.158)	
Asia				1.119*** (0.103)		
Latin America				0.862*** (0.125)		
Africa				-0.347** (0.152)		
Middle East				-0.236** (0.116)		
East Europe				1.948*** (0.098)		
Constant	22.701*** (0.199)	18.335*** (2.445)	11.655*** (0.436)	10.148*** (0.613)	10.015*** (0.438)	1.012*** (0.174)
Adjusted R^2	0.886	0.897	0.916	0.922	0.935	0.988
Observations	1000	1000	982	982	982	900
Wald test (*P*-value)	0.000	0.000	0.000	0.000	0.000	

White heteroscedasticity corrected standard errors are in parenthesise. ***, **, * indicate significance level at the 1 percent, 5 percent and 10 percent, respectively. For legends see Appendix Table A4.1

Table A4.7 Determinants of corruption: generalised least square (period weights)

Dependent variable: corruption perception index						
	(1) **PLS**	(2) **PLS**	(3) **PLS**	(4) **PLS**	(5) **PLS**	(6) **GMM**
Log (RGDP)	-1.992*** (0.050)	-1.962*** (0.077)	-0.878*** (0.085)	-0.576*** (0.095)	-0.457*** (0.051)	-0.122*** (0.023)
ALR		0.046*** (0.004)	0.028*** (0.004)	-0.007* (0.004)	0.017*** (0.003)	
LED (Tertiary)		-0.015*** (0.004)	-0.011*** (0.003)	-0.011*** (0.003)	-0.006** (0.003)	
GINI		0.029*** (0.006)	0.040*** (0.005)	0.051*** (0.006)	0.022*** (0.005)	
UNEM		0.027*** (0.006)	0.013*** (0.005)	0.019*** (0.005)	0.014*** (0.005)	
DEMO			0.090*** (0.020)	0.090*** (0.021)	0.087*** ((0.018)	
EF			-0.757*** (0.040)	-0.613*** (0.039)	-0.674*** (0.037)	
Lag CPI						0.939*** (0.009)
MICs					0.225 (0.154)	
HICs					-1.600** (0.239)	
Asia				1.143*** (0.149)		
Latin America				0.671*** (0.192)		
Africa				-0.302 (0.208)		
Middle East				0.016 (0.158)		
East Europe				1.798*** (0.137)		
Constant	22.831*** (0.434)	17.560*** (0.774)	12.420*** (0.710)	10.148*** (0.613)	10.387*** (0.777)	1.373*** (0.242)
Adjusted R^2	0.617	0667	0.760	0.814	0.803	0.970
Observations	1000	1000	982	982	982	900
Wald test (*P*-value)	0.000	0.000	0.000	0.000	0.000	

White heteroscedasticity corrected standard errors are in parenthesise. ***, **, * indicate significance level at the 1 percent, 5 percent and 10 percent, respectively. For legends see Appendix Table A4.1

Table A4.8 Relationship between per capita income and infant mortality rate and sanitation

Dependent variable: Log (RGDP)		
	(1)	(2)
Infant mortality	-0.024***	-0.011***
	(0.003)	(0.003)
Sanitation	0.009***	0.013***
	(0.004)	(0.003)
ALR		-0.005
		(0.004)
LED (Tertiary)		-0.005*
		(0.003)
GINI		-0.006***
		(0.005)
UNEM		-0.006
		(0.007)
DEMO		-0.011
		(0.018)
EF		0.217***
		(0.035)
Constant	8.654***	7.604***
	(0.373)	(0.468)
Adjusted R^2	0.766	0.883
Observations	100	99

White heteroscedasticity corrected standard errors are in parenthesise. ***, **, * indicate significance level at the 1 percent, 5 percent and 10 percent, respectively. For legends see Appendix Table A4.1

Table A4.9 Relationship between corruption and regional dummies without control variables

Dependent variable: corruption perception index	
	(1)
Asia	3.744***
	(0.021)
Latin America	3.676***
	(0.078)
Africa	4.365***
	(0.085)
Middle East	2.516***
	(0.052)
East Europe	4.422***
	(0.049)
Constant	2.607***
	(0.048)
Adjusted R^2	0.513
Observations	1000

White heteroscedasticity corrected standard errors are in parenthesise. ***, **, * indicate significance level at the 1 percent, 5 percent and 10 percent, respectively.

Appendix Table A4.10 List of countries by income classification

Low Income Countries (LICs):

Bangladesh, Congo Democratic Republic, Cote d' Ivore, Ethiopia, Ghana, India, Kenya, Kyrgyzstan, Myanmar, Nigeria, Pakistan, Sudan, Tajikistan, Tanzania, Uzbekistan, Vietnam and Yemen.

Middle Income Countries (MICs):

Albania, Algeria, Argentina, Armenia, Azerbaijan, Belarus, Bosnia, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Ecuador, Egypt, Estonia, Georgia, Guatemala, Hungary, Indonesia, Iran, Iraq, Jordon, Kazakhstan, Latvia, Lithuania, Macedonia, Malaysia, Mexico, Moldova, Morocco, Oman, Peru, Philippines, Poland, Romania, Russia, Serbia, Slovakia, South Africa, Sri Lanka, Syria, Thailand, Turkey, Turkmenistan, Ukraine and Venezuela.

High Income Countries (HICs):

Australia, Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Kuwait, Luxemburg, Malta, Netherlands, New Zealand, Norway, Portugal, Qatar, Saudi Arabia, Singapore, Slovenia, South Korea, Spain, Sweden, Switzerland, Taiwan, United Arab Emirates, United Kingdom and United States.

Source: World Bank 2005

CHAPTER 5

The Role of Democracy in Controlling Corruption: A Theoretical Perspective

5.1 Introduction

The examination of variation in the level of corruption across countries (Chapter 4) finds the direct correlation between democracy and corruption. This crucial result reveals that a higher degree of democracy fosters corruption. However, the result appears to contradict the emerging consensus that the features of a democratic process reduce corruption. Hence, it is important to pursue further and examine the role of democracy in controlling corruption. Also, there has been little theoretical analysis concerning the process of democratisation's influence on the extent of corruption. This chapter presents a theoretical model of the relationship between democratisation and corruption and to confirm whether there exists a non-linear effect of democracy on corruption.

Greater democracy, i.e. an expansion of political freedom, has dampening effects on the level of corruption. Barro (1999) argues that democratic institutions provide the checks on governmental power which, in turn, limits the potential of public officials to accumulate personal wealth and to carry out unpopular policies. In contrast, Doig (2000) points out that in many electoral democracies, under the mask of political participation, political elites continue to manipulate the electoral process to legitimise retention of power and use the state machinery in pursuit of their own interests. The studies on the relationship between democracy and corruption produce some opposing results. Some studies find that democracy prevents corruption while others suggest that democracy enhances corruption. Therefore, an important question to be resolved is whether democracy necessarily reduces a country's level of corruption.

The worldwide evidence reflects that there is an inverse relationship between democracy and corruption, i.e. countries with democratic governments lean towards

lower levels of corruption. The idea that democracy has a negative impact on corruption seems indisputable (Sung, 2004). However, the degree of influence of democratic reform on corruption level is not straightforward and uniform. The main reason for the disagreement among researchers resides in the multidimensionality characteristics of "democracy" or "democratisation" (Coppedge, 2002; Sung, 2004). The empirical studies mostly support the negative democracy-corruption association (Goldsmith, 1999; Sandholtz and Koetzle, 2000; Treisman, 2000; Montinola and Jackman, 2002; Sung, 2004; Bohara et al., 2004). Yet, some of these studies differ in regard to the directions of the impact of democratic reforms on the level of corruption. For example, democracy viewed as freedom of speech nurtures an investigative journalism that exposes and deters corrupt public activities (Giglioli, 1996; Brunetti and Weder, 2003). Alternatively, other studies find a non-linear relationship between democracy and corruption. Despite the upsurge of corruption among intermediate democracies, the consolidation of advanced democratic institutions eventually reduces corruption. Ultimately, the initial political conditions and the final democratic achievements determine the magnitude of political corruption (Montinola and Jackman, 2002; Sung, 2004). Moreover, Treisman (2000) points out that the long exposure to democracy predicts lower corruption than the current acquisition of democracy. On the contrary, Ades and Di Tella (1999) find that political rights have no significant impact on corruption because countries like Hong Kong and Singapore experience very low levels of corruption even though they have relatively moderate political rights.

This study explores the hypothesis that an existence of 'electoral democracy' in the early stages of democratisation is not sufficient to reduce corruption.[44] The role of sound democratic institutions, including an independent judiciary and an independent media along with active political participation are crucial for combating corruption. The trustworthy democratic institutions and healthy political competition significantly contribute to accelerating anti-corruption reform. The histories of countries where once-high levels of corruption have fallen support this view.

[44] The concept of electoral democracy emerges from Schumpeter's (1947) emphasis on electoral competition as the core of democracy. The contemporary minimalist concept of democracy or equivalently an 'electoral democracy' is a multi-party system where there are regular elections (which are relatively free and fair) but deficient in many important aspects that define a liberal democracy. See Diamond (1996) and Tronquist (1999, p. 98) for details.

Illustrating the hypothesis, this study develops a simple model that focuses on the role of democratic institutions, where it is assumed that the detection probability is a function of democracy. Under this assumption the active and effective institutions lead to a careful monitoring of agents which, in turn, increases the probability of detection and punishment of corrupt activities and overall reduces the level of corruption. In other words, well-functioning democratic institutions create a potential threat to corrupt behaviour and hence restrain the level of corruption.

The rest of the chapter is organised as follows: the next section briefly outlines an overview of democracy-corruption relationship. Section 5.3 set out the basic model addressing the hypothesis examined here. Whether there is an existence of a non-linear democracy-corruption relationship is presented in section 5.4. Section 5.5 explains the theoretical perspectives of various relationships amongst democracy, income and corruption, and Section 6.6 concludes the chapter.

5.2 Democracy-Corruption Association: An Overview

Theoretically, autocratic systems are characterised by the monopolisation of power in the hands of a small elite, with few or no constraints to prevent the small elite exercising their own interest and, thus, a high level of corruption prevails in the autocratic regimes. In contrast, democratic systems are characterised by diffuse authority, where the executive branches of government are balanced by an elected parliament and an independent judiciary, and where open elections allow actors to alternate in power. This diffusion of authority acts as a threat to the corrupt political elites, and has a lowering effect on the level of corruption.[45] The transformation from autocratic regime towards democracy through political liberalisation is often presumed to reduce the level of corruption. Rose-Ackerman (1978) was the first to suggest that competition between officials keeps the level of bribe relatively low and may even entirely eliminate the practice of taking bribes. Her argument is based on the possibility of overlapping jurisdictions, i.e. low bribe returns and the honesty of some officials may push the market-clearing bribe-price still lower, inducing other officials to give up corruption.

[45] See Fjelde and Herge (2007) for details.

However, the generally agreed increase in corruption levels in transition countries is not consistent with the view that democracy has a positive impact on controlling corruption. The increased corruption level in transition countries has been described as 'decentralised corruption' by Shleifer and Vishny (1993), where transformation towards democracy represents a transformation from joint monopoly power to individual monopoly power of the political elites. The transformation towards individual monopoly power tends to increase the amount of bribe charged by each government official. In the context of democratic transformation, Herge et al. (2001) argue that the transformation from authoritarian regime towards democracy is complicated and intermediate regimes are the most conflict-prone. They argue that the source of the conflict is the inherent contradictions within societies that are neither democratic nor autocratic. There are numerous examples of renewed corrupt practices induced by political liberalisation in South East Asia and the former Soviet Republic (Cohen, 1995; Harris-White and White, 1996).

The weak institutional frameworks in the newly democratised countries increase the opportunities for high level corruption. The newly democratised countries are mostly characterised as electoral democracies and they typically belong to the low-end of 'free' category of nations as tracked by the Freedom House democracy index records.[46] Political institutions in a newly formed electoral democracy lack the institutional resources to restrict corrupt political elites from furthering their own interests. Dahl (1971) argues that democracy without participation is an absurdity but participation without an effective institutional framework would be futile and chaotic. Supporting the idea Doig (2000) points out that democracy represents institutional arrangements to secure the rule of law, participation of the people in the activities of the state, and the institutional embodiment of a concern with the identification and realisation of public interest at least in principle. Shleifer and Vishny (1993) also claim that the structure of government institutions and the political process are the most important determinants of the level of corruption.

In describing the role of democracy on combating corruption Sandholtz and Koetzle (2000, p. 38) note that in a democracy the populace acquires more extensive and

[46] See Freedom House (2003) for details.

effective means of detecting and punishing corrupt activities. Furthermore, fundamental democratic freedoms, like those of assembly, speech and media, expose hidden information, stipulate inquiries, and publicise discoveries. Corruption, by its nature, is conducted secretly, and secrets are harder to keep in an open society. Once the public is aroused over a corruption scandal, the organs of government have powerful incentives to prosecute and punish miscreants or at least to be seen to do so. In this context, Rose-Ackerman (1999), Schwartz (1999), Jamieson (2000) and Moran (2001) point out that the defence of civil liberties and the materialisation of an independent judiciary, the key elements that define a "liberal democracy", can restrain corruptive influences and maximise the efficacy of anti-corruption campaigns.[47]

Examples of a negative connection between democracy and corruption are abound. However, there are numerous examples where this negative correlation between democracy and corruption does not exist. For example, in the case of India and Singapore - India is one of the most corrupt countries, as well as one of the democratic nations in the world. Transparency International's 2001 Report indicates India is the 72nd most corrupt country in the world, out of 90 countries surveyed. The existence of high level of corruption in India can be explained by Gunnar Myrdal's notion of India as a "Soft State" where law is there but the enforcement is poor.[48] Democracy, simply viewed as political participation, does not ensure protection of liberties and public interest. On the contrary, corruption was wide spread in Singapore in the 1950s, but in recent years it is widely recognised as a squeaky clean nation with very little corruption. Although Singapore has a representative democracy where representatives retain the freedom to exercise their own judgment, the enforcement in Singapore seems ludicrously strict as noted in Klitgaard (1988, p. 122), which reduces the level of corruption. On the other hand, South Korea provides an interesting example of a democracy-corruption relationship. The South Korean evidence

[47] Diamond (1996, p. 3) suggests that in addition to regular, free and fair electoral competition and universal suffrage, liberal democracy requires: i) absence of reserved domains of power for the military or other social or political forces, ii) "horizontal" accountability of office holders to another which constrains executive power and helps protect constitutionalism, the rule of law and the deliberative process, and iii) extensive provisions for political and civil pluralism, as well as for individual and group freedoms.

[48] See Myrdal (1968, p. 66) for details.

illustrates an existence of a non-linear relationship between democracy and corruption. Following the initial democratisation in the 1980s it experienced a growing level of corruption, however, in recent years it has achieved reductions in the level of corruption.[49]

Transparency International's CPI scores for India, Singapore and South Korea during 1980-2004 are presented in Table 5.1. It is quite obvious that the corruption level increases in India, while it decreases in Singapore. The trend of CPI score in South Korea indicates that corruption levels became low under the leaderships of Kim Young-Sam (1993-1996), Kim Dae-jung (1998-2002), and Roh Moo-Hyun (2003-2004) compared with the regimes of Chun Doo-Whan (1980-1987) and Roh Tae-Woo (1988-1992). Furthermore, the lowest CPI score of 3.50 over the period 1988-1992 indicates that corruption flourishes in the early stage of democratisation. Since 1993, the CPI score increases gradually except for the period 1997-1999, suggesting that democratic reforms and the growth of civil society seem to increasingly play a positive role in curbing corruption in South Korea.[50]

The word democracy represents both electoral democracy and liberal democracy. However, there is a gap between these two concepts that causes serious consequences on theory, policy, and comparative analysis. The wave of transition begins with the formation of an electoral democracy and through the continuous process of democratisation a country can reach the advanced level of liberal democracy. A fully developed mature democracy is an ideal state with well-functioning and effective institutions along with active participation of the people. It describes a situation, where, the combination of free media, an independent judiciary and people's participation represent a viable threat to the corrupt behaviour and accelerate the process of anti-corruption reforms. In other words, extensive democratic freedom and effective democratic institutions are vital for controlling corruption. Accordingly, despite an increase in the level of corruption in the early stages of democratisation, a consolidated well-functioning mature democracy can reduce a country's level of corruption.

[49] See You (2005) for details
[50] Low CPI scores during 1997 to 1999 partly reflect the aftermath impact of financial crisis occurred in 1997.

Table 5.1 Corruption perception index for India, Singapore and South Korea

	CPI 80-85	CPI 88-92	CPI 93-96	CPI 97-04
India	3.67	2.89	2.63	2.79
Singapore	8.41	9.16	8.80	9.15
South Korea	3.93	3.50	5.02	4.23

Source: CPI from Transparency International, Historical data, 1995 Report.
Note: Low CPI score indicates high level of perceived corruption.

5.3 The Model

To illustrate the issues of transformation from dictatorship towards an advanced democracy the chapter considers a simple model of a bureaucracy regulating the private agents in the economy. The government officials hold the power either to issue new permits or licenses to operate private economic activities, or, regulating the conduct of private firms in the economy and they have the opportunity to restrict the quantity. If the official is corrupt, then he/she collects bribes in return for providing the permits.[51] A bribe is generated through illegal or corrupt transactions. We assume that if the official is corrupt he/she will charge a bribe equal to *B*.

Next, it is assumed that the level of corruption in a country ℓ depends on the proportion of bribe takers P_b, which is defined as:

$$\ell = a_1 + a_2 P_b \tag{5.1}$$

where a_1 and a_2 are greater than or equal to 0 and $d\ell/dP_b$ is greater than 0. The level of corruption in a country reflects the corrupt behaviour (i.e. bribes demanded by government officials and/or bribes offered to government officials by the private agents) of that country. This also represents a number of corrupt transactions that take place in a country. A high level of corruption means an increase in corrupt transactions and a greater overall rent extracted by the state. The level of corruption function ℓ is structured here to capture the existence of corruption even if the countries are declared as corruption free by various international organisations such

[51] Any extra payment additional to the actual price made to the bureaucrat by a private agent for getting permits or licenses will be termed a "bribe."

as Transparency International. In equation (5.1), a_1 is positive, even though it is very small. Consider for instance, a country like New Zealand; Transparency International's 2005 *Corruption Perception Index Report* confirms the squeaky clean image of New Zealand as it scores 9.6 and is tied for the second place with Finland. Although New Zealand has a squeaky clean reputation, some cases involving bribery and corruption of government officials have been noted.[52]

Now, each official's cost of taking a bribe is given by C and $C \varepsilon [0, C_1]$, where the lowest cost of taking a bribe equals 0, and the highest cost of taking a bribe is C_1. Thus, for a range of parameter values, some officials solicit bribes and some officials do not. Moreover, some officials are indifferent between soliciting a bribe and not soliciting a bribe. The low individual cost of being corrupt, therefore, represents a higher propensity to take a bribe. In addition, the cost of being corrupt also determines the proportion of bureaucrats taking a bribe and the higher individual cost of being corrupt reduces the proportion of bribe takers. It is reasonable to assume here that the distribution of the cost of being corrupt, C, is uniform. This assumption simplifies the analysis by allowing the proportion of corrupt officials to be written as C_x / C_1 where C_x is the cost of corruption for an official who is indifferent between soliciting a bribe and not soliciting a bribe (the pivotal official).

The key assumption of this analysis is that the probability of detection and punishment of corrupt acts, denoted by θ, is a function of democracy. For the purpose of this study, the democracy index, d is assumed to take values from 10 to 0, where 10 is a full dictatorship and 0 is a full democratic state. In a situation of full dictatorship, there are no legal or other constraints to prevent the dictator exercising his/her will. Thus, the probability that the dictator will be caught acting corruptly is negligible and even 0. In contrast, with full democracy, all institutions associated with the modern democratic state operate effectively. Thus, there is a probability of 1 that a corrupt act will be detected and punished. The probability of detection and punishment increases with the expansion of greater democracy at lower values of d,

[52] Brown, J.-M. (2000, September 16). Corruption is alive and well in 'honest' NZ. *New Zealand Herald*. URL is available at: http://www.nzherald.co.nz/search/story.cfm?storyid=9260297C-39D9-11DA-8E1B-A.

and it decreases at higher values of *d*, during transition stages. The probability of detection and punishment function is represented as:

$$\theta = e^{-d} \tag{5.2}$$

where, $0 \leq d \leq 10$. The detection and punishment function is formulated based on the idea that the democracy index *d* mostly depends on active political participation of people, active media and an independent judiciary. The democracy index focuses on the various components of democracy. In the early stage of democratisation where *d* is close to 10, the role of the media and judiciary is almost negligible. However, with the continuous process of democratisation, a country reaches the mature stage where all components of democracy operate actively and efficiently. In particular, the active and efficient role of media and judiciary increase the probability of detecting and punishing corrupt activities. Moreover, the detection and punishment function θ also depends on the degree to which the population is informed and educated. In other words, the probability of detection and punishment is dependent on how likely the population knows that corruption is occurring and how able they are to do something about it.

Next, it is assumed that the government official is paid the ongoing wage *W*. If corrupt, he/she receives his/her wage *W* plus bribe income *B* less cost of being corrupt *C* with probability $(1 - \theta)$, and with probability θ, he/she loses everything subject to the limited liability (Acemoglu and Verdier, 2000). Hence, the official is willing to become corrupt if $[W - C + B](1 - \theta) > W$, that is, the expected payoff from behaving corruptly must be at least, as large as the ongoing wage *W*. The pivotal corrupt official has the cost of being corrupt C_x where:

$$[W - C_x + B](1- \theta) = W \tag{5.3}$$

$$W - C_x + B - \theta W + \theta C_x - B \theta = W$$

$$C_x (1- \theta) = B (1 - \theta) - \theta W$$

$$C_x = B - [\theta / 1 - \theta]\, W$$

$$C_x = B - [e^{-d} / (1 - e^{-d})]\, W \qquad (5.4)$$

We can re-write equation (5.4) as:

$$C_x/C_1 = [B - \{e^{-d} / (1 - e^{-d})\}\, W] / C_1 \qquad (5.5)$$

where C_1 is a constant.

Equation (5.5) determines the proportion of bribe takers, which is a function of democracy. Now, the partial differentiation of C_x/C_1 with respect to democracy variable d i.e. a one unit change in the value of democracy index changes the proportion of bribe takers by $\partial(C_x/C_1)/\partial d$ which can be expressed as:

$$\partial(C_x/C_1)/\partial d = (\partial/\partial d)\, [B - \{e^{-d} / (1 - e^{-d})\}\, W] / C_1$$

$$\partial(C_x/C_1)/\partial d = [e^{-d} / (1 - e^{-d})^2]\, W / C_1 > 0 \qquad (5.6)$$

The positive sign of $\partial(C_x/C_1)/\partial d$ indicates a one unit decrease in the value of democracy index (i.e. greater democracy), lowers the proportion of bribe takers by $[e^{-d} / (1 - e^{-d})^2]\, W$.[53] In other words, an expansion of democracy (i.e. lower value of d) increases the probability of detection and punishment, which in turn reduces the proportion of bribe takers. The proportion of pivotal bribe takers in terms of democracy index is given by:

$$P_b = C_x/C_1 = [B - \{e^{-d} / (1 - e^{-d})\}\, W] / C_1 \qquad (5.7)$$

Thus, the level of corruption can be expressed as:

$$\ell = a_1 + a_2\, [B - \{e^{-d} / (1 - e^{-d})\}\, W] / C_1 \qquad (5.8)$$

[53] As the wage rate W cannot be negative.

Equation (5.8) illustrates the inverse (negative) relationship between democracy and the level of corruption. In other words, less democracy enhances the corruption level in a country due to the lower possibility of getting caught and punished. A high degree of democracy provides less opportunity for the government officials to extract bribes and increases the cost of taking a bribe, which in turn reduces the level of corruption in a country. Hence, a high probability of getting caught and punished causes decision-makers to refrain from engaging in corrupt practices. However, the rate of change of the level of corruption and democracy is not always uniform. Early stages of democratisation and the mature advanced democracy do not compress the level of corruption in the same rate. The advanced level of democracy has a greater power to detect and punish corrupt activities than early democratisation stages. Thus there is a possibility of the existence of a non-linear relationship between democracy and corruption, which is discussed in the following section.

5.4 Non-Linear Democracy-Corruption Relationship

Equation (5.6) shows a negative association between democracy and the level of corruption, however, the rate of change of a decrease in corruption is not uniform throughout the values of democracy index ranging from 10 to 0. A non-linear democracy-corruption relationship expresses the idea of non-uniformity i.e. as the degree of detection and punishment increases the corruption level decreases – to a greater extent in the mature stages compared to the early stages of democratisation. In other words, the transition stage mainly manifests the selection of political leaders through election and allows considerable restrictions on citizenship rights (Huntington,1991; Diamond,1996), it cannot eliminate the restrictive elements of autocracy completely, which fosters the opportunities for corruption in transition countries. However, over time, the development of institutional structures allows people to enjoy political and civil rights, media freedom and the protection of an independent judiciary. Thus, the existence of all these factors together increases the strength of democracy which can control corruption levels more efficiently. In other words, the level of democracy strengthens the efficacy of democratic systems once a moderate amount of rights with institutional foundations have been attained.

The non-linearity of the democracy-corruption relationship can be viewed by the slope of $\partial(C_x / C_1)/\partial d$. The slope $\partial(C_x / C_1)/\partial d$ can be determined by differentiating equation (5.6) with respect to d which is shown in the following equation:

$$\partial^2(C_x/C_1)/\partial d^2 = (W / C_1)[\{(1 - e^{-d})^2 (- e^{-d}) - 2(1 - e^{-d}) (e^{-2d})\} / (1 - e^{-d})^4]$$

$$= - (W / C_1) e^{-d} [(1 + e^{-d}) / (1 - e^{-d})^3] < 0 \qquad (5.9)$$

The negative sign of the equation (5.9) suggests that as the value of d increases (i.e. if a country moves towards autocracy) the magnitude of $\partial^2(C_x / C_1)/\partial d^2$ decreases whereas the magnitude is large enough when d closes to 0 (i.e. democracy is in a mature stage). In other words, a mature democracy is more effective in combating corruption than a country in the early stages of democracy.

For clarity of thought it is useful to provide a numerical illustration of the detection and punishment function. The illustration shows what happens to the proportion of bribe takers as the democracy level increases (i.e. lower value of d). The strategy used to devise this illustration is to begin with selecting the values of d from 10 to 0 in the detection function θ which gives the non-linearity scenario of the detection and punishment being negligible during the transition period but the value of detection and punishment function increases when mature democracy is in place. The values of the probability of detection and punishment and the proportion of bribe takers at various level of democracy (i.e. 10 to 0) are presented in Table 5.2.

It can be seen from the table that during the transformation from autocracy towards democracy i.e. the change of d at the higher level, say, from $d = 10$ to $d = 9$ the probability of detection and punishment is very small. However, the change of the democracy level, from $d = 2$ to $d = 1$ increases the probability of detection and punishment to a greater extent. In other words, at the top level of democracy, further democratisation strengthens the monitoring process and enhances the probability of detection and punishment.

Table 5.2 Relationship among democracy level, probability of detection and punishment and proportion of bribe takers

d	$\theta = e^{-d}$	C_x/C_1			$\Delta(C_x/C_1)$
		$W = 3000$ $C_1 = 5000$ $B = 5000$	$W = 3000$ $C_1 = 5000$ $B = 3000$	$W = 3000$ $C_1 = 5000$ $B = 2000$	
0	1				
1	0.368	0.6508	0.2508	0.0508	
2	0.135	0.9061	0.5061	0.3061	-0.2553
3	0.050	0.9686	0.5686	0.3686	-0.0625
4	0.018	0.9888	0.5888	0.3888	-0.0203
5	0.007	0.9959	0.5959	0.3959	-0.0071
6	0.002	0.9985	0.5985	0.3985	-0.0026
7	0.001	0.9995	0.5995	0.3995	-0.0009
8	0.0003	0.9998	0.5998	0.3998	-0.0004
9	0.0001	0.99993	0.59993	0.39993	-0.0001
10	0.00004	0.99997	0.59997	0.39997	-4.7E-05

Note: C_x/C_1 is calculated as per the formula $C_x/C_1 = [B - \{e^{-d} / (1 - e^{-d})\} W] / C_1$

Furthermore, the wage rate W and the bribe level B also determine the proportion of bribe takers. Table 5.2 demonstrates three different levels of bribes and their impact on the proportion of bribe takers, i.e. bribe level greater than the level of income, equal to the level of income and less than the actual income level. The smaller the bribe level is, ceteris paribus, taking a bribe is more costly and less attractive which restrains government officials from taking a bribe. On the one hand, for a given level of wage rate, $W = 3000$, corruption is higher at the democracy level $d = 9$ than $d = 1$, at any level of bribes. On the other hand, compared to the bribe level $B = 5000$, the corruption level decreases substantially at the bribe level $B = 2000$. The result in the last column shows the changes in the proportion of bribe takers suggesting that the rate of change of controlling the level of corruption increases at the lower value of d.[54] At the lower value of d (i.e. towards mature democracy), the changes in democracy level reflect that fewer officials will choose to act corruptly. The

[54] The negative values in the last column describe the decrease in the proportion of bribe takers due to the expansion of democracy (with lower value of d).

relationship between the probability of getting caught and democracy level is illustrated in Figure 5.1.

Figure 5.1 Relationship between democracy and probability of getting caught and punished

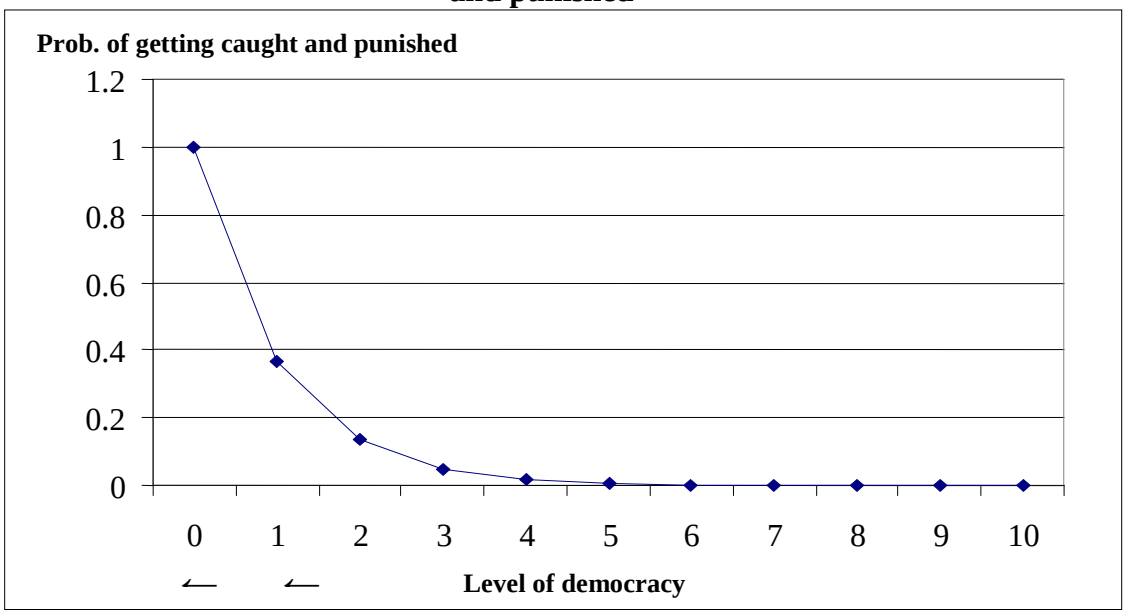


Figure 5.1 illustrates the non-linear relationship between democracy level and the probability of getting caught and punished. At a high level of democracy, further democratisation increases the probability of getting caught and punished, which in turn reduces the propensity for corruption and decreases its level of occurrence in a country.

5.5 Democracy, Income and Corruption

In examining the hypothesis on a democracy-corruption nexus, it is imperative to focus on the income level of a country. A common view is that prosperity stimulates democracy (Aristotle, 1932; Lipset, 1959; Barro, 1999). The low income countries generate minimal wealth for the vast majority of people and most of the people live in real poverty, which restrains them from participating intelligently and efficiently in politics. Moreover, lack of self-restraint forces them to capitulate to the reckless political agitators.

Barro's (1999) study finds that an increase in the standard of living initiates a gradual rise in democracy. He further points out that a democracy which arises without prior economic development (for example, democracy imposed by colonial powers) does not last long. Substantial economic development strengthens the democratisation of non-democratic countries e.g. South Korea, Taiwan and Portugal. Conversely, lack of economic development causes democracy to fail. For examples some African countries like Congo, Nigeria and Somalia which gained independence in the early 1960s.

Equation (5.5) demonstrates that a well-functioning democracy (when d moves towards zero), is capable of deterring corruption at the highest possible level. However, it also illustrates that a relatively higher value of W accelerates the rate of controlling the level of corruption when a country moves towards a well-functioning democracy. Thus, high-income countries are able to pay high wages to the bureaucrats which reduce the incentive to act corruptly. The Transparency International's 2005 corruption perception index supports the theoretical expectations about the correlations between corruption, democracy and income (see Table A5.1 in the Appendix). Comparatively, the countries possessing well-developed democracies and highly developed economies are seen as least corrupt. Nations that fall at this end include Denmark, Finland, Iceland, Canada, New Zealand, and Sweden. On the contrary, the most corrupt countries are traditionally viewed as authoritarian and less developed economies. Examples of the most corrupt nations include Bangladesh, Indonesia, Kenya, and Nigeria.

In the case of Singapore, however, a low level of corruption is seen despite the fact that Singapore does not experience the same level of political freedoms as most developed countries. The high level of economic development and well functioning institutions and enforcement of laws have made this achievable (Klitgaard, 1988). On the other extreme case of India, which has been a democracy for more than sixty years, is seen as quite corrupt. India's low economic development and lack of enforcement enhances the corruption level (Myrdal, 1968).

Overall, countries that are known to be well-developed democracies are also economically highly developed. The direct relationship between well-developed democracies and economic development is generally regarded as being relatively straight forward. Low-income countries cannot create enough resources, which constrain the government's ability to commit resources for the development and functioning of democratic institutions. Resource constraints restrain monitoring and detection activities in the poor countries. In addition, high level of corruption augments the overall resource extraction by the state which, in turn, further aggravates the economic situation of poor countries.

5.6 Conclusion

In describing the role of democracy the chapter has examined the importance of well functioning institutions for deterring corruption. The result confirms that a well-functioning democracy deters corruption, where the probability of being caught for engaging in corrupt activities is high. A fully-formed democracy is, of course, more than a democratically elected government. It requires effectively operating institutions for the implementation of democratic goals like political and civil rights, media freedom and an independent judiciary. The widely accepted axiom in the Western democratic world is that "Eternal Vigilance is the Price of Democracy", may lead to a lower level of corruption. The result also confirms a non-linear relationship between democracy and corruption. At the early stages of democratisation more democracy increases corruption however, at a higher level of democracy further democratistion reduces corruption efficiently where the probability of getting caught and punished is high.

To further evaluate the evidence based on the model developed in this chapter it is important to empirically examine the relationship between democracy and corruption. The next chapter presents the empirical examination results of the cross-country analysis using the panel data for 100 countries for the period 1995 to 2004.

APPENDIX 5

This appendix consists of Table A5.1 that presents the Transparency International's 2005 corruption perception index (CPI).[55]

Table A5.1 Transparency International 2005 corruption perceptions index

Rank	Country	2005 CPI score		Rank	Country	2005 CPI score
1	Iceland	9.7		80	Senegal	3.2
2	Finland	9.6		81	Sri Lanka	3.2
3	New Zealand	9.6		82	Suriname	3.2
4	Denmark	9.5		83	Lebanon	3.1
5	Singapore	9.4		84	Rwanda	3.1
6	Sweden	9.2		85	Dominican Republic	3
7	Switzerland	9.1		86	Mongolia	3
8	Norway	8.9		87	Romania	3
9	Australia	8.8		88	Armenia	2.9
10	Austria	8.7		89	Benin	2.9
11	Netherlands	8.6		90	Bosnia and Herzegovina	2.9
12	United Kingdom	8.6		91	Gabon	2.9
13	Luxembourg	8.5		92	India	2.9
14	Canada	8.4		93	Iran	2.9
15	Hong Kong	8.3		94	Mali	2.9
16	Germany	8.2		95	Moldova	2.9
17	United States	7.6		96	Tanzania	2.9
18	France	7.5		97	Algeria	2.8
19	Belgium	7.4		98	Argentina	2.8
20	Ireland	7.4		99	Madagascar	2.8
21	Chile	7.3		100	Malawi	2.8
22	Japan	7.3		101	Mozambique	2.8
23	Spain	7		102	Serbia and Montenegro	2.8
24	Barbados	6.9		103	Gambia	2.7
25	Malta	6.6		104	Macedonia	2.7

[55] CPI score relates to perceptions of the degree of corruption as seen by business people and country analysts and ranges between 10 (highly clean) and 0 (highly corrupt).

Table A5.1 continues

Rank	Country	2005 CPI score		Rank	Country	2005 CPI score
26	Portugal	6.5		105	Swaziland	2.7
27	Estonia	6.4		106	Yemen	2.7
28	Israel	6.3		107	Belarus	2.6
29	Oman	6.3		108	Eritrea	2.6
30	United Arab Emirates	6.2		109	Honduras	2.6
31	Slovenia	6.1		110	Kazakhstan	2.6
32	Botswana	5.9		111	Nicaragua	2.6
33	Qatar	5.9		112	Palestine	2.6
34	Taiwan	5.9		113	Ukraine	2.6
35	Uruguay	5.9		114	Vietnam	2.6
36	Bahrain	5.8		115	Zambia	2.6
37	Cyprus	5.7		116	Zimbabwe	2.6
38	Jordan	5.7		117	Afghanistan	2.5
39	Malaysia	5.1		118	Bolivia	2.5
40	Hungary	5		119	Ecuador	2.5
41	Italy	5		120	Guatemala	2.5
42	South Korea	5		121	Guyana	2.5
43	Tunisia	4.9		122	Libya	2.5
44	Lithuania	4.8		123	Nepal	2.5
45	Kuwait	4.7		124	Philippines	2.5
46	South Africa	4.5		125	Uganda	2.5
47	Czech Republic	4.3		126	Albania	2.4
48	Greece	4.3		127	Niger	2.4
49	Namibia	4.3		128	Russia	2.4
50	Slovakia	4.3		129	Sierra Leone	2.4
51	Costa Rica	4.2		130	Burundi	2.3
52	El Salvador	4.2		131	Cambodia	2.3
53	Latvia	4.2		132	Republic of Congo	2.3
54	Mauritius	4.2		133	Georgia	2.3
55	Bulgaria	4		134	Kyrgyzstan	2.3
56	Colombia	4		135	Papua New Guinea	2.3
57	Fiji	4		136	Venezuela	2.3
58	Seychelles	4		137	Azerbaijan	2.2
59	Cuba	3.8		138	Cameroon	2.2
60	Thailand	3,8		139	Ethiopia	2.2
61	Trinidad and Tobago	3,8		140	Indonesia	2.2
62	Belize	3.7		141	Iraq	2.2
63	Brazil	3,7		142	Liberia	2.2
64	Jamaica	3.6		143	Uzbekistan	2.2

Table A5.1 continues

Rank	Country	2005 CPI score
65	Ghana	3.5
66	Mexico	3.5
67	Panama	3.5
68	Peru	3.5
69	Turkey	3.5
70	Burkina Faso	3.4
71	Croatia	3.4
72	Egypt	3.4
73	Lesotho	3.4
74	Poland	3.4
75	Saudi Arabia	3.4
76	Syria	3.4
77	Laos	3.3
78	China	3.2
79	Morocco	3.2

Rank	Country	2005 CPI score
144	Congo, D. R.	2.1
145	Kenya	2.1
146	Pakistan	2.1
147	Paraguay	2.1
148	Somalia	2.1
149	Sudan	2.1
150	Tajikistan	2.1
151	Angola	2
152	Cote d'Ivoire	1.9
153	Equatorial Guinea	1.9
154	Nigeria	1.9
155	Haiti	1.8
156	Myanmar	1.8
157	Turkmenistan	1.8
158	Bangladesh	1.7
159	Chad	1.7

CHAPTER 6

Democracy and Corruption: An Empirical Analysis in a Cross-Country Framework

6.1 Introduction

Democracy is generally considered as an important and powerful control against government malfeasance (Barro, 1999). The reason is that freedom of association and a free press supplemented by an independent judiciary lead to a closer monitoring and punishment of unjust activities. Hence, democratic countries have less corruption than dictatorial countries. However, the result in Chapter 4 defies the effect of democracy on controlling corruption and augments the existing debate in the literature. Thus, this chapter continues the investigation presented in Chapter 5 and offers an empirical evaluation of the impact of democratisation on corruption.

The main purpose of the empirical analysis is to provide supportive evidence on the overall structure of the democracy-corruption relationship discussed in the theoretical model developed in Chapter 5. An advanced fully-formed mature democracy, where the probability of being caught and punished if acting corruptly is high, is crucial to combat corruption. The key implications of the model require testing whether an electoral democracy represented by political rights is sufficient to reduce corruption. Democracy defined in the broad and narrow perspectives are used in explaining corruption.

There is no cross-country evidence in the existing literature that captures the comparative analysis based on aggregate measures of democracy, as well as its various components, separately to find out what aspect of democracy contributes more in controlling corruption. This chapter differs from earlier literature in three ways: first, following Barro (1999) it further develops the idea of “narrow-democracy” (proxied by political rights) and “broad-democracy” proxied by an aggregate index of political rights, civil liberties and freedom of the press). The

concept of narrow democracy comes from Huntington's (1991) study, which defines democracy as the selection of leaders through competitive elections by the people. Following this idea the recent studies of democracy mainly focus on the role of elections. See Gastil (1978) and the Freedom House Report that compile electoral rights data. Bollen (1990) constructed a related variable (i.e. political liberties and popular sovereignty) for inclusion in the democracy index. Barro (1990) notes that Freedom House civil liberties index is a broader concept of democracy that covers freedoms of speech, press freedom and religion and also considers a variety of legal protections. Extending the idea of a broader concept of democracy this chapter constructs a broad-democracy index by combining political rights, civil liberties and press freedom as well, while the narrow democracy index includes only the political rights.

Second, besides narrow-democracy and broad-democracy, the chapter evaluates the impact of other individual components of democracy such as civil liberties and press freedom separately and the combined effect of political rights and civil liberties on controlling corruption. Third, it examines the non-linearities between democracy and corruption in a non-linear functional form for various components of democratic indicators by controlling for several relevant economic factors. Furthermore, panel data estimations have been utilised to examine the degree of influence of democratic reform on corruption levels.

The cross-country study examines the following hypotheses: first, to test if a 'narrow-democracy' represented by 'political rights' is sufficient to control corruption. Second, an advanced fully-formed mature democracy denoted by 'broad-democracy', is examined where the probability of being caught if acting corruptly is high that is crucial to combat corruption. Third, is to test the non-linear relationship to demonstrate if democracy increases corruption in the early stages of democratic reforms; and its consecutive trends in terms of what the threshold point is. Following the estimation of the threshold level the fourth hypothesis tests whether corruption decreases as a country moves towards a mature democracy.

This chapter is arranged as follows: the following section presents the conceptual issues of democracy index followed by a discussion on the data, empirical models and methodology in section 6.3. Section 6.4 discusses the panel estimation results for various democracy-corruption specifications. Section 6.5 tests the robustness of the results. Section 6.6 presents the evidence of non-linear relationships and the conclusions are stated in the final section.

6.2 Conceptual Issues of Democracy Indices

Like corruption, the measurement of democracy is also disputed due to the problems of conceptualisation, measurement and aggregation (Munck and Verkuilen, 2002). Munck and Verkuilen (2002) and Coppedge (2002) point out that no single index offers a satisfactory response to all three problems which have significant weaknesses. In order to capture the impact of broadly defined democracy the definition adopted by Jackman (1985), is followed where democracy is defined as an "umbrella concept" that combines multiple components into a single unidimensional variable. The Freedom House subjective indexes of political rights, civil liberties and press freedom are utilised to construct a broad-democracy index for the estimation purposes. The political rights include the electoral process and the political pluralism and functioning of government. The civil liberties encompass freedom of expression and belief, associational and organisational rights, rule of law and personal autonomy and individual rights. The components of press freedom are laws and regulations, political controls and economic control. Each of the components of political rights, civil liberties and press freedom is based on multiple criteria.[56]

The existing indices of democracy demonstrate significantly varying degrees of attention for the selection of indicators and how to combine multiple indicators to represent a single composite indicator. Ades and Di Tella (1999), Ali and Isse (2003), and Sung (2004) use Freedom House political rights as a proxy for democracy whereas the civil liberties index of democracy is used in Emerson (2006). Moreover, Nelson and Singh (1998), Sandholtz and Koetzle (2000), Gounder (2002) and Bohara et al., (2004) construct the composite democracy index by using the arithmetic average of political rights and civil liberties indices. In Chapter 4 the

[56] See http://www.freedomhouse.org for details.

method of averaging political rights and civil liberties indices has been followed for the construction of a single democracy (DEMO) index.

However, in this chapter following Shen and Williamson (2005) the Freedom House press freedom variable is combined with political rights and civil liberties to measure the broad-democracy index which reflect the legal and enforcement capabilities of government that strengthens and accelerates the anti-corruption reforms. For combining the multiple dimension of democracy following Vanhanen (2000), an equally weighted broad-democracy index (DEMO2) is constructed by multiplying political rights, civil liberties and press freedom as these three dimensions of democracy are not mutually independent but are equally important for democracy.[57] The broad-democracy index is scaled from 0 to 10, where a higher score indicates a higher level of freedom.[58]

As an umbrella concept democracy combines multiple components, however, Jackman (1985) suggests that it is imperative to focus on their individual components as well. Therefore, it is analytically more constructive to begin the analysis by measuring the attributes separately in order to estimate the individual effects on controlling corruption. In this way the study provides a more comprehensive and rigorous test of the influence of individual components as well as composite democracy indicators on corruption for a comparative analysis. For this purpose the Freedom House indices of political rights (PR), civil liberties (CL) and press freedom (Press) are examined separately. Like broad-democracy index, separate individual indices are also scaled from 0 to 10, where a higher score indicates a higher level of freedom.

As a further check, the study replicates the estimations with an alternative measure of democracy, i.e. using Vanhanen's democratisation index. Vanhanen index of democratisation combines the degree of electoral competition and electoral participation as a measure of democracy. This dataset covers the period 1810-2000 and it includes 187 contemporary and former independent states from the year 1810

[57] Arat (1991) and Alvarez et al. (1996) also combine several attributes of democracy following multiplicative aggregation rule.
[58] In Chapter 5, a higher value of democracy index indicates less democracy.

or from the year of independence. However, this study examines the democracy-corruption relationship using Vanhanen index for the period 1995-2000. Vanhanen's democratisation index is an objective measure where the competition variable is calculated by subtracting the percentage of votes won by the largest party from 100, and the participation variable is calculated from total population.[59] For sensitivity analysis former British colony, federal states, protestant tradition and imports of goods and services as a percentage of GDP variables are incorporated along with the other socio-economic variables. The list of countries that are former British colony and federal states are based on the Treisman (2000) study. Protestant tradition is obtained from La Porta et al. (1998) and the data for imports of goods and services as a percentage of GDP is taken from the World Development Indicators.

6.3 Data, Models and Methodology

This section discusses the data, models and methodology used to estimate the proposed hypotheses to explain the degree of influence of various democracy indicators on combating corruption across countries. First, the data definitions are presented followed by models and methodology.

6.3.1 Data description

As stated in Chapter 4, the dependent variable in this study is Transparency International's (TI) annual corruption perceptions index (CPI). In addition, the control of corruption index (CCI), as an alternative measure of corruption is used for the sensitivity analysis.

A set of standard economic variables i.e., per capita real gross domestic product (RGDP), unemployment rate (UNEM), gini index (GINI) of inequality and adult literacy rate (ALR), and economic freedom index (EF) are incorporated as the control variables in the basic regression model. Appendix Table A6.1 provides descriptive statistics of all the variables used in the estimations.

[59] See Vanhanen (2000) for details.

6.3.2 Model specifications

We begin the analysis by focusing on narrowly defined democracy which is represented by political rights (PR) and its influence on controlling corruption. To estimate the impact of political rights, civil liberties and press freedom as a measure of narrow-democracy on corruption, the basic regression models are specified as follows:

$$CPI_{i,t} = \beta_0 + \beta_1 PR_{i,t} + \beta_2 \log (RGDP)_{i,t} + \beta_3 GINI_{i,t} + \beta_4 UNEM_{i,t} + \beta_5 ALR_{i,t} + \beta_6 EF_{i,t} + \varepsilon_{i,t}, \quad (6.1a)$$

$$CPI_{i,t} = \beta_0 + \beta_1 CL_{i,t} + \beta_2 \log (RGDP)_{i,t} + \beta_3 GINI_{i,t} + \beta_4 UNEM_{i,t} + \beta_5 ALR_{i,t} + \beta_6 EF_{i,t} + \varepsilon_{i,t}, \quad (6.1b)$$

$$CPI_{i,t} = \beta_0 + \beta_1 Press_{i,t} + \beta_2 \log (RGDP)_{i,t} + \beta_3 GINI_{i,t} + \beta_4 UNEM_{i,t} + \beta_5 ALR_{i,t} + \beta_6 EF_{i,t} + \varepsilon_{i,t}, \quad (6.1c)$$

where CPI is corruption perception index, PR is political rights, CL is civil liberties, Press is press freedom, RGDP is real GDP per capita, GINI is gini index, UNEM is unemployment rate, ALR is adult literacy rate, EF is economic freedom index, ε is error term, i is country and t is time. The sign and significance of β_1 is of interest; PR coefficient is expected to be negative to reflect that electoral democracy reduces corruption. CL and Press both have the expected negative signs which measure the degree of separate components of narrow-democracy.

The next step is to measure the influence of full democracy that has the combined effects on controlling corruption. First, the broad-democracy includes the combined effects of political rights and civil liberties (DEMO1), and second the broad-democracy index is DEMO2 which includes PR, CL and press freedom. Other control variables are similar to equations (6.1a) to (6.1c). Broad-democracy index DEMO2 and DEMO1 are constructed by multiplying equally weighted components of political rights, civil liberties and press freedom. The broad-democracy equations are as follows:

$$CPI_{i,t} = \beta_0 + \beta_1 DEMO1_{i,t} + \beta_2 \log (RGDP)_{i,t} + \beta_3 GINI_{i,t} + \beta_4 UNEM_{i,t} + \beta_5 ALR_{i,t} + \beta_6 EF_{i,t} + \varepsilon_{i,t}, \quad (6.2a)$$

$$CPI_{i,t} = \beta_0 + \beta_1 DEMO2_{i,t} + \beta_2 \log (RGDP)_{i,t} + \beta_3 GINI_{i,t} + \beta_4 UNEM_{i,t} + \beta_5 ALR_{i,t} + \beta_6 F_{i,t} + \varepsilon_{i,t}, \quad (6.2b)$$

where DEMO1 includes political rights and civil liberties and DEMO2 includes political rights, civil liberties and press freedom.

In the final step the study tests the democracy-corruption relationship in a non-linear framework for the various components of both narrow-and broad-democracy separately. Only the non-linear narrow-democracy model with PR variable is shown which has the following form:

$$CPI_{i,t} = \beta_0 + \beta_1 PR_{i,t} + \beta_2 (PR_{i,t})^2 + \beta_3 EF_{i,t} + \beta_4 \log (RGDP)_{i,t} + \beta_5 \log (RGDP))^2_{i,t} + \beta_6 GINI_{i,t} + \beta_7 UNEM_{i,t} + \beta_8 ALR_{i,t} + u_{i,t}, \quad (6.3)$$

where u is error term. The coefficients β_1 and β_2 are altered with CL, Press, DEMO1 and DEMO2.

For the estimation of the non-linear relationship the signs of β_1 and β_2 in equation (6.3) are of interest and it is expected that β_1 to be positive and β_2 to be negative. The expected sign of β_1 and β_2 represents a parabolic relationship between democracy and corruption i.e., at the early stages of democratisation, democracy increases corruption, after a certain level it has a negative impact on corruption.

6.3.3 Econometric methodology

In order to estimate the impact of separate components of democracy and the combined effects of democracy indices on corruption, the panel estimation methodologies are used based on equations (6.1a) to (6.1c), (6.2a) to (6.2b) and (6.3) for the period 1995 to 2004. It also confirms the relationship between democracy and corruption for non-outlier countries. For the robustness checks two-way fixed effects (country and period), two-way random effects and period fixed effects with

regional dummies are estimated. Moreover, following Dawson (2003), and Nelson and Singh (1998) a two-period (5-year average for two period i.e. 1995-1999 and 2000-2004) and a three-period (3-year average for three periods i.e. 1995-1997, 1998-2000 and 2001-2004) panels are estimated to eliminate potential business cycle effects that are assumed to be present in annual data.

As an alternative econometric methodology the estimates of the ordinary least square (OLS) for the average period 1995-2004, is undertaken as a single period. In addition, the partial regression technique is utilised to test the non-linear relationship between narrow-and broad-democracy and corruption. All estimations are carried out with white heteroskedasticity consistent standard errors.

6.4 Panel Estimation Results

The impact of various components of democracy and the combined democracy indices on corruption are first examined by utilising panel least squares (PLS), two-way fixed effects (FE), two-way random effects (RE) and period fixed effect with regional dummies (PFERD) based on equation (6.1a-6.1c) and (6.2a-6.2b). The dependent variable in these equations is corruption perception index for 100 countries over 1995 to 2004 period.

The panel estimation results for the democracy-corruption relationship are presented in Table 6.1. Columns (1)-(4) display the results for a narrowly defined democracy index. The panel least square results in column (1) indicate that the coefficient of political rights has a positive sign and is significant at the 1 percent level. The reason behind the positive sign is that when a country begins to transform towards democracy, it manifests only 'electoral democracy' represented by political rights but may be deficient in the many important aspects of democracy that are more crucial to reduce corruption. A one-standard-deviation increase in political rights increases corruption by 0.30 points, and approximately 11 percent of a standard deviation in the corruption index.[60] Except literacy rate the signs and magnitudes of

[60] A one-standard-deviation increase of PR is calculated by multiplying the coefficient of PR (0.082) and the standard deviation of PR i.e. 3.663, which gives 0.30 points. It can also be explained by 0.30/2.669 (standard deviation of corruption perception index) * 100 equals to 11 percent of a standard deviation of CPI.

the coefficients of the other control variables are all consistent with the expected signs (as shown in Chapter 4) and are significant at the conventional confidence levels, i.e. at the 1 to 5 percent level of significance. The sign of political rights (PR) coefficient confirms the observed high level of corruption in transition countries. The specification in column (1) explains more than three-fourth of the variation in the levels of corruption across countries.

Columns (2), (3) and (4) report the relationship between political rights and corruption after controlling for country and period fixed effects, two-way random effects and period fixed effects with 12 regional dummies.[61] The two-way fixed effects (column (2)) do not alter the expected sign and the significance level of political rights coefficient although the magnitude of the coefficient decreases. Two-way random effects in column (3) also indicate that political rights increase corruption although the effect is not significant.[62] Column (4) displays similar results and the coefficient of political rights is significant at the 1 percent level suggesting that the relationship between political rights and corruption is not driven by regional differences.[63] The adjusted R^2 value increases in columns (2) and (4) in comparison with column (1) indicating that the inclusion of the period, country and regional dummies improves the fit of the regression. The effect of political rights on the level of corruption is noteworthy. The absolute value of the coefficient varies between 0.006 and 0.082, which indicates that a one standard deviation increase in the political rights increases corruption between 0.02 and 0.30 points or between 0.82 and 11.3 percent of a standard deviation in the corruption perception index.

[61] Two-way fixed effects estimate the effects inserting the dummies for each country and each period which reduces the degrees of freedom of estimation. Instead, period fixed effects with regional dummies incorporate dummies for each region and each period that increases the degrees of freedom and improves the estimation results.

[62] The estimated Hausman test value of 0.912 which is greater than 0.1, supports that random effects are more appropriate than fixed effects.

[63] Regional dummies also portray the cultural differences among the regions. The results further reflect that high levels of corruption in transition economies (i.e. economies in East Europe, Latin America and East Asia) may not be affected by any cultural differences.

Table 6.1 Impact of narrow-and broad-democracy on controlling corruption: corruption perception index as dependent variable

Dependent Variable: Corruption perception index										
	All Country								**Without Outliers**	
	(1) **PLS**	(2) **FE**	(3) **RE**	(4) **PFERD**	(5) **PLS**	(6) **FE**	(7) **RE**	(8) **PFERD**	(9) **PLS**	(10) **PLS**
PR	0.082*** (0.011)	0.040*** (0.013)	0.006 (0.01)	0.065*** (0.014)					0.061*** (0.018)	
DEMO2					-0.095*** (0.011)	-0.019 (0.020)	-0.065*** (0.019)	-0.004 (0.015)		-0.170*** (0.023)
Log (RGDP)	-0.967*** (0.022)	-0.323 (0.459)	-0.984*** (0.082)	-0.809*** (0.046)	-0.920*** (0.027)	-0.359 (0.474)	-0.870*** (0.089)	-0.800*** (0.048)	-1.015*** (0.082)	-0.934*** (0.081)
GINI	0.041*** (0.003)	0.119*** (0.014)	0.096*** (0.007)	0.045*** (0.005)	0.032*** (0.004)	0.118*** (0.014)	0.094*** (0.007)	0.045*** (0.006)	0.039*** (0.005)	0.028*** (0.005)
UNEM	0.012** (0.005)	0.005 (0.006)	0.013 (0.009)	0.019*** (0.004)	0.017*** (0.005)	0.006 (0.006)	0.014 (0.009)	0.018*** (0.004)	0.014*** (0.005)	0.021*** (0.005)
ALR	0.023*** (0.002)	-0.021*** (0.012)	0.007 (0.010)	-0.007*** (0.004)	0.032*** (0.002)	-0.021** (0.009)	0.008 (0.010)	-0.003 (0.004)	0.025*** (0.003)	0.035*** (0.003)
EF	-0.768*** (0.022)	-0.117*** (0.021)	-0.181*** (0.032)	-0.559*** (0.019)	-0.596*** (0.019)	-0.114*** (0.020)	-0.170*** (0.031)	-0.509*** (0.016)	-0.724*** (0.041)	-0.488*** (0.040)
Latin America				0.996*** (0.388)				0.977*** (0.368)		
Middle East				0.505 (0.437)				0.325 (0.447)		
East Asia				1.914*** (0.523)				1.811*** (0.522)		
South East Asia				1.219*** (0.401)				1.023*** (0.412)		
South Asia				1.029** (0.442)				1.147*** (0.434)		
Eastern Europe				2.030*** (0.364)				2.051*** (0.368)		
Central Asia				1.573*** (0.289)				1.301*** (0.336)		
Africa				-0.162 (0.395)				-0.221 (0.385)		

Table 6.1 continues

	All Country								Without Outliers	
	(1) **PLS**	(2) **FE**	(3) **RE**	(4) **PFERD**	(5) **PLS**	(6) **FE**	(7) **RE**	(8) **PFERD**	(9) **PLS**	(10) **PLS**
Western Europe				0.627 (0.469)				0.688 (0.453)		
Northern Europe				-0.709 (0.481)				-0.670 (0.465)		
North America				-0.341 (0.404)				-0.322 (0.385)		
Australasia				-0.946** (0.442)				-0.933** (0.423)		
Constant	13.358*** (0.677)	5.899 (4.037)	10.452*** (0.381)	12.654*** (0.514)	12.478*** (0.691)	6.517*** (4.140)	9.615*** (0.518)	12.462*** (0.535)	13.561*** (0.680)	12.182*** (0.681)
Observations	981	981	1000	981	981	981	1000	981	959	959
Countries	99	99	1000	99	99	99	1000	99	96	96
Adjusted R^2	0.757	0.956	0.292	0.837	0.756	0.956	0.292	0.835	0.755	0.766
Wald test (*P*-value)	0.003		0.004	0.006	0.003		0.009	0.001	0.009	0.008
F-statistic		192.956				192.374				

Note: PLS, FE, RE and PFERD denote panel least squares, two-way fixed effects, two-way random effects and period effect with regional dummies, respectively.
White standard errors are in parenthesise. ***, **, * indicate significance level at the 1, 5 and 10 percent, respectively.
Legend: PR is political rights, DEMO2 is broad democracy index which includes political rights, civil liberties and press freedom, RGDP is real gross domestic product per capita, GINI is gini index, UNEM is unemployment rate, ALR is adult literacy rate and EF is economic freedom index.

Columns (5)-(8) show the results for a broadly defined democracy index (DEMO2) for PLS, FE, RE and PFERD estimations based on equations (6.2b). The coefficients of the broad-democracy index (DEMO2) in columns (5), (6), (7) and (8) indicate the expected negative sign. This demonstrates that a mature democracy with the existence of political rights, civil liberties and press freedom can reduce the level of corruption in a country. The coefficient of DEMO2 is significant at the 1 percent level in columns (5) and (7), however, in columns (6) and (8) the magnitudes of the coefficient have declined substantially and are not significant. The absolute value of the coefficient ranges from 0.004 to 0.095 suggesting that a one standard deviation increase in broad-democracy decreases corruption between 0.01 and 0.35 points or between 0.55 percent and 13 percent of a standard deviation in the corruption perception index. The two-period and three-period panel estimation results for the sensitivity analysis reported in Appendix Table A6.2 also confirm that narrow-democracy increases corruption whereas a broad-democracy reduces corruption.[64]

The impact of narrow and broadly defined democracies in controlling corruption for the countries without the outlier are depicted in columns (9) and (10) for PLS estimations.[65] Column (9) illustrates the similar results as shown in columns (1), i.e. narrow-democracy increases corruption. Likewise, column (10) portrays the similar results as reported in columns (5), i.e. broad-democracy reduces corruption. Moreover, the estimated coefficient of PR and DEMO2 are significant at the 1 percent level. As noted, in the case of excluding outlier countries, the magnitude of the coefficient of PR is much lower in comparison with the all country case. In contrast, the magnitude of the coefficient of DEMO2 is far greater for without outlier countries. For example, in column (10) a one standard-deviation increase in DEMO2 reduces the perception of corruption by 0.57 points, approximately 21.5

[64] The coefficient of PR and DEMO2 are significant at 1 percent level for both the two-period and three-period PLS estimations.

[65] The study treats Hong Kong, Serbia and Montenegro and Singapore as outlier countries in the sample. Hong Kong and Singapore have low levels of democracy and low levels of corruption, while Serbia and Montenegro has high levels of democracy and high levels of corruption. Although, the Hadi test result for detecting outliers shows Serbia and Montenegro being the only outlier in the sample, however, the observed evidence of Hong Kong and Singapore reflects that in spite of having a very low level of democracy these two countries experience a very low level of corruption. This view is supported by Ades and Di Tella (1999) who note that political rights have no effect on corruption in these two countries.

percent of a standard deviation in the CPI.[66] The result suggests that a mature democratic nation which is manifested by a broad-democracy has a stronger and more significant effect on controlling corruption. The removal of outliers marginally improves the fit of the regression in column (10) (the adjusted R^2 for broad-democracy index increases from 0.756 to 0.766 for PLS estimations).

The next step discusses the estimated component for other narrow-democracy (i.e. civil liberties (CL) and press freedom (Press)) and broad-democracy (the composite index of political rights and civil liberties (DEMO1)). The separate effects are measured using the same set of control variables shown in Table 6.1. The estimated results are presented in Table 6.2. Like the political rights (PR) coefficient (see Table 6.1), the CL and Press coefficients in Table 6.2 also have positive effects on corruption for the all countries. In other words, having just civil liberties or just press freedom increases the level of corruption in a country. The estimated results demonstrate that individual components of democracy alone cannot engender enough controls for restraining corruption.

Table 6.2 Impact of other indicators of democracy on controlling corruption

	All Countries			Without Outliers		
	CL	**Press**	**DEMO1**	**CL**	**Press**	**DEMO1**
PLS	0.038***	0.031	-0.012	-0.003	-0.021	-0.060***
	(0.012)	(0.022)	(0.010)	(0.024)	(0.030)	(0.020)
PFERD	0.051***	0.088***	0.021*	0.011	0.030	-0.025
	(0.018)	(0.022)	(0.011)	(0.023)	(0.027)	(0.019)

Note: PLS is panel least squares and PFERD is period effect with regional dummies. CL is civil liberties, Press is press freedom and DEMO1 includes political rights and civil liberties.
White standard errors are in parenthesise. ***, **, * indicate significance level at the 1, 5 and 10 percent, respectively. The adjusted R^2 ranges between 0.75 and 0.96 for the eighteen specifications.
All estimates include a constant as well as all the control variables incorporated in the base equation (not reported).

The PLS estimation results of without outlier countries show the negative effects for civil liberties and press freedom indicators although the coefficients are not significant. However, the coefficients of CL and Press become positive after controlling for the period and regional dummies (PFERD). The results suggest that

[66] A one-standard-deviation increase of DEMO2 is calculated by multiplying the coefficient of DEMO2 (0.170) and the standard deviation of DEMO2 i.e. 3.372, which gives 0.57 points. It can also be explained by (0.57/2.669 (standard deviation of corruption perception index) * 100 equals to 21.5 percent of a standard deviation of CPI.

civil liberties and press freedom cannot produce sufficient evidence to confirm the role of these factors separately in reducing corruption even in the case of without outlier nations.

The composite effects of political rights and civil liberties provide some mixed results in controlling corruption for all countries in the sample. The coefficient of DEMO1 is negative in panel least square estimation shown in (Table 6.2), however the coefficient is positive and significant after controlling for period and regional dummies. In contrast, the result after excluding the outlier countries shows a significantly stronger effect in controlling corruption as the DEMO1 coefficient is negative in both cases and significant at the 1 percent level in PLS estimation. The negative sign and a greater magnitude of the coefficient of DEMO1 reveals that the combined effect of political rights and civil liberties appears to be more crucial for controlling corruption than the individual effects. Therefore, political rights and civil liberties together are vital for reducing corruption. The result supports the view that democratic countries tend to be less corrupt than undemocratic nations. It is interesting to note that the different method of construction of DEMO1 (see Table 6.2) in comparison with DEMO in Chapter 4 (see Table 4.2) produces an opposite result of the same components of democracy (i.e. combination of political rights and civil liberties).[67] In other words, DEMO (includes political rights and civil liberties) in Chapter 4 increases corruption whereas, DEMO1 (includes political rights and civil liberties) decreases corruption (Chapter 6).

The comparison of the results of DEMO1 (includes political rights and civil liberties) and DEMO2 coefficients (includes political rights, civil liberties and press freedom) suggests that DEMO2 has a much stronger effect in controlling corruption than DEMO1. More interestingly, the magnitude of the DEMO2 coefficient increases to 0.170 (see Table 6.1, column (10)) for the without outlier countries and this improvement in the magnitude is solely due to the effect of press freedom component added to the broad-democracy index. Indeed, the broad-democracy index (i.e. DEMO2) which represents an advanced level of democracy with the existence of all

[67] The democracy variable (DEMO) in Chapter 4 is constructed by averaging political rights and civil liberties indices whereas DEMO1 in Chapter 6 is constructed by multiplying political rights and civil liberties indices.

components of democracracy, generates a more larger effect in controlling corruption than DEMO1 (see Tables 6.1 and 6.2). The findings confirm the study by Knack and Keefer (1995) which states that only political rights and civil liberties indicators are insufficient proxies for the quality of democratic institutions.

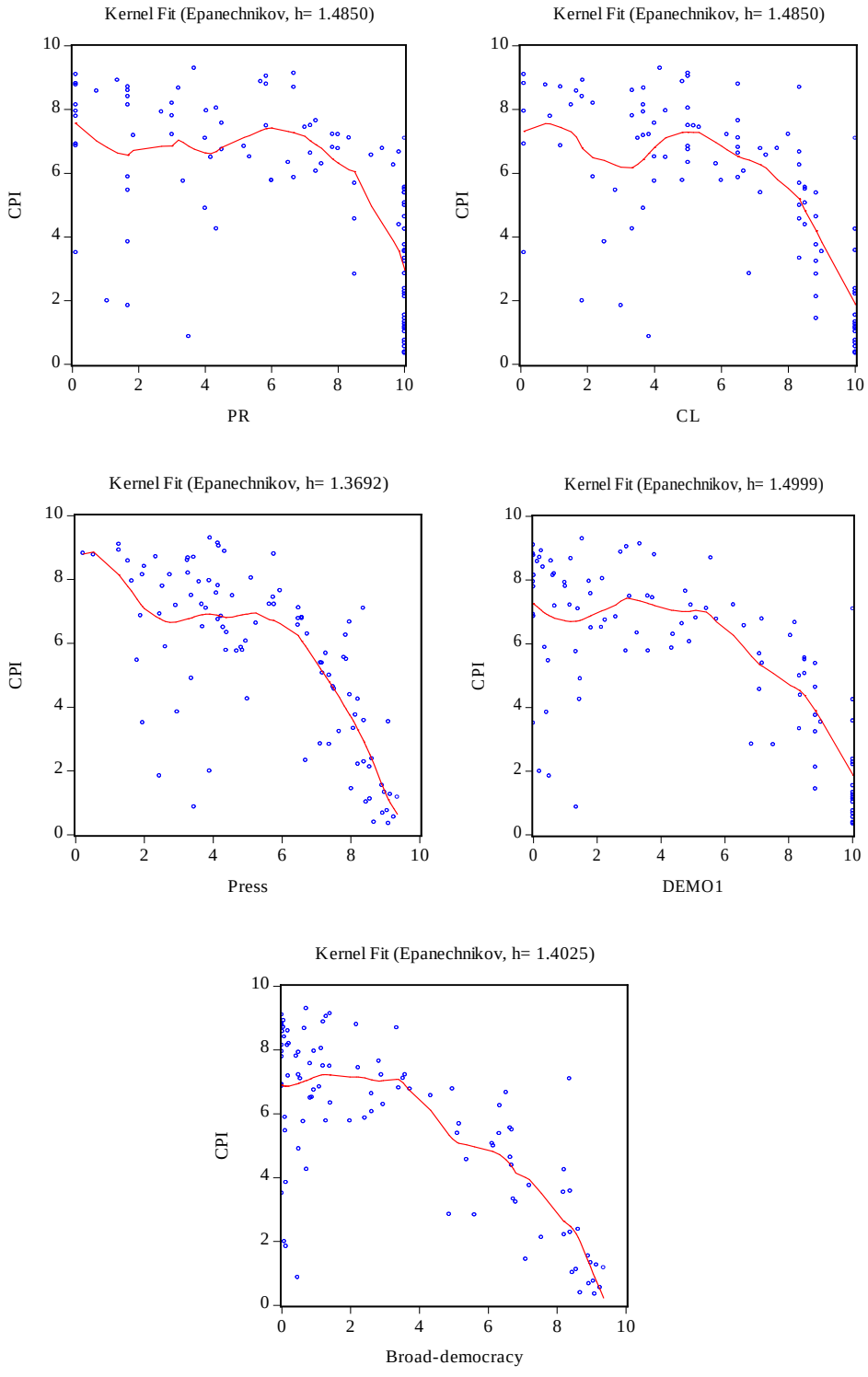
Finally, political rights a narrowly defined measure of democracy increases corruption at a higher rate compared to other individual components of democracy in all specifications (see Tables 6.1 and 6.2). This clearly suggests that an electoral democracy at the early stages of democratisation increases corruption. In contrast, a broad-democracy (DEMO2) measure possesses potentially a higher effective mechanism for controlling corruption. Figure 6.1 shows the Kernel fits of various individual and composite indices of democracy and corruption to illustrate the close relationship between democracy and corruption.

Inspection of each figure confirms the estimation results of the impact of various democracy indicators in controlling corruption. That is, political rights, civil liberties and press freedom indicators show positive effects on corruption (i.e. political rights increase the corruption level), whereas the combined democracy indicators, in particular, the broad democracy index portrays substantially negative effects on the level of corruption (i.e. decreases corruption). The figures also confirm the existence of outliers (i.e. existence of low level of corruption and low levels of democracy and high level of corruption and high level of democracy) which are consistent with the analysis. An interesting point to note in Figure 6.1 is that the scatter plots of various democracy indicators and the level of corruption illustrate the existence of a non-linear relationship between democracy and corruption (this is discussed in section 6.6).

6.5 Sensitivity Analysis

Analysing the relationship between democracy and corruption utilising the panel estimation technique raises the question of whether the results are due to some characteristics of specific technique and data. In order to address these issues an alternative technique, another measure of corruption and the measures of democracy are used to check the robustness of the results in this section.

Figure 6.1 The relationship between democracy indicators and corruption



Note: PR is political rights, CL is civil liberties, Press is press freedom, DEMO1 includes political rights and civil liberties, Broad-democracy includes political rights, civil liberties and press freedom and CPI is the corruption perception index.

6.5.1 Cross-section results

It is interesting to note that the corruption perception index varies, more across countries rather than over time. Therefore, much of the empirical study on the causes of corruption emphasises on cross-country analysis. This section presents an ordinary least square (OLS) analysis of democracy-corruption relationship using a 10-year average of the period from 1995 to 2004. The OLS estimation results are reported in Table 6.3. Columns (11), (12) and (13) are for narrow-democracy (i.e. political rights) and columns (14), (15) and (16) results are for broad-democracy (i.e. DEMO2 which includes political rights, civil liberties and press freedom).

Column (11) estimates the base specification of equation (6.1), the results indicate that PR coefficient is positive and significant at 1 percent level and the magnitude of the coefficient is greater than the panel least squares estimation shown in column (1), Table 6.1. Column (12) includes four regional dummies i.e. Asia, Latin America, Africa and Eastern Europe as further control variables. The former British colonies, federal states, protestant tradition and imports of goods and services as a percentage of GDP are incorporated as additional control variables to the base equation in column (13).[68] The inclusion of regional dummies and the additional control variables, however, do not change the sign of PR coefficient in columns (12) and (13). The largest estimated value of the political rights coefficient is 0.158 points, thus a one standard deviation increase in narrow-democracy index (political rights) increases corruption by 0.579 points.[69]

The estimated OLS coefficients in columns (14), (15) and (16) report the results of the broad-democracy indicator (DEMO2). The sign of the estimated coefficients of DEMO2 are negative although they are insignificant. The estimated largest absolute value of the coefficient of DEMO2 of 0.069 implies that a one standard deviation

[68] In federally structured states, competition among government officials increases. Weingast (1995) and Rose-Ackerman (1978) have argued that federal structures make more honest and efficient government by providing for competition between sub-jurisdictions. By contrast, Shleifer and Vishny (1993) argue that when officials monopolise complementary products, they are likely to overgaze, which leads to sub-optimal over extraction.

[69] A one-standard-deviation increase of PR is calculated by multiplying the coefficient of PR (0.133) and the standard deviation of PR, i.e. 3.663, which gives 0.579 points.

Table 6.3 OLS estimates for democracy and corruption relationship

Dependent variable: corruption perceptions index						
	PR			**DEMO2**		
	(11)	(12)	(13)	(14)	(15)	(16)
PR	0.133***	0.116*	0.158**			
	(0.044)	(0.053)	(0.049)			
DEMO2				-0.069	-0.003	-0.001
				(0.072)	(0.078)	(0.082)
Log (RGDP)	-0.832***	-0.577**	-0.795***	-0.856***	-0.647**	-0.895***
	(0.227)	(0.269)	(0.240)	(0.237)	(0.274)	(0.257)
GINI	0.036**	0.042**	0.029*	0.027*	0.034*	0.022
	(0.015)	(0.017)	(0.015)	(0.015)	(0.018)	(0.017)
UNEM	0.007	0.014	0.004	0.013	0.018	0.008
	(0.015)	(0.012)	(0.014)	(0.015)	(0.013)	(0.015)
ALR	0.020**	-0.006	0.011	0.031***	-0.010	0.023**
	(0.010)	(0.011)	(0.010)	(0.010)	(0.011)	(0.010)
EF	-0.953***	-0.815***	-0.970***	-0.719***	-0.650***	-0.749***
	(0.103)	(0.133)	(0.117)	(0.105)	(0.130)	(0.128)
Asia		1.189***			1.133***	
		(0.380)			(0.410)	
Latin America		0.756			0.964**	
		(0.465)			(0.468)	
Africa		-0.155			-0.228	
		(0.489)			(0.436)	
Eastern Europe		1.482***			1.552***	
		(0.382)			(0.399)	
Federal state			0.060			0.181
			(0.311)			(0.313)
British colony			-0.360			-0.452
			(0.273)			(0.281)
Percent Protestant			-1.705***			-1.686***
			(0.534)			(0.570)
(Imports/GDP) (%)			0.008*			0.005
			(0.005)			(0.006)
Constant	13.294***	11.923***	13.843***	12.713***	12.239***	13.980***
	(1.898)	(2.445)	(2.071)	(1.885)	(2.334)	(2.068)
Observations	99	99	97	99	99	97
Adjusted R^2	0.810	0.848	0.837	0.799	0.837	0.818
Serial Correlation test (*P*-value)	0.759	0.765	0.963	0.618	0.576	0.779
Normality test (*P*-value)	0.587	0.401	0.357	0.945	0.778	0.891
Heteroskedasticity test (*P*-value)	0.326	0.707	0.719	0.652	0.575	0.907

Note: for legends see Table 6.1.
White standard errors are in parenthesise. ***, **, * indicate significance level at the 1, 5 and 10 percent, respectively.

increase in broad-democracy index reduces corruption by 0.23 points.[70] It is worth noting that the sign of the coefficients of federal states, former British colony and

[70] A one-standard-deviation increase of DEMO2 is calculated by multiplying the coefficient of DEMO2 (0.069) and the standard deviation of DEMO2, i.e. 3.372, which equals to 0.23 points.

protestant tradition in columns (13) and (16) confirm the claim and findings of Shleifer and Vishny (1993), and Treisman (2000) that federal state increases the opportunities of corruption, whereas countries as former British colonies and protestant tradition are less corrupt. However the positive coefficient of imports to GDP share, i.e. a higher level of import increases corruption is not consistent with Treisman (2000).

The OLS estimation results in Table 6.3 strongly confirm our hypothesis that narrow-democracy measured by political rights is not sufficient to reduce corruption; instead it may increase corruption during the transition period. The high level of corruption in the East European countries (transition countries) supports this result. On the contrary the result finds a slightly weaker support for confirming that broad-democracy is crucial for combating corruption.

6.5.2 Alternative corruption measure

The panel and cross-section estimation results in Tables 6.2 and 6.3 are for the specific measure of corruption. This raises the question of whether these results are the characteristics of specific data since corruption perception indices are based on subjective measurement. In order to address this issue the study further examines an alternative measure of corruption indicator using the control of corruption index (CCI) constructed by Kaufmann et al. (2005).

The OLS estimation results of the impact of narrow-democracy and broad-democracy using the alternative corruption measure, i.e. control of corruption index, are reported in Table 6.4. In both cases the coefficients of democracy indicators are positive but the effect is much weaker for political rights. The DEMO2 results suggest that mature level of democracy increases the control of corruption significantly whereas a narrow-democracy shows the similar controls but it is not statistically significant. The partial effects of political rights (narrow-democracy) and broad-democracy on the level of corruption are 4.6 percent and 20.1 percent respectively. In other words, the evidence strongly supports the hypothesis that broad-democracy plays a more effective and significant role in combating corruption than narrow-democracy.

Table 6.4 Effect of narrow-and broad-democracy on the control of corruption index, 1996-2004

Dependent variable: average control of corruption index	**PR**	**DEMO2**
Democracy indicator	0.046 (0.041)	0.201*** (0.061)
Observations	99	99
Adjusted R^2	0.846	0.872

Note: PR is political rights and DEMO2 includes political rights, civil liberties and press freedom. Both estimates include a constant as well as all the control variables incorporated in the base equation but not reported here.
White standard errors are in parenthesise. *** indicates significance level at the 1 percent level.

6.5.3 Alternative measure of democracy

The next step tests the impact of democracy on corruption using Vanhanen's democratisation index as an alternative measure of democracy. The index is based on an objective measure by combining the two dimensions of democracy, i.e., competition and participation.[71] The competition represents the percentage share of votes for the smaller parties and independents in the parliamentary elections and is calculated by subtracting the percentage of votes won by the largest party from 100 percent. The participation dimension measures the percentage of the population that actually voted in the election. The democratisation index is constructed by multiplying competition and participation and dividing the outcome by 100. The results of the basic specification for the combined democratisation index as well as for individual components are shown in Table 6.5. Combined democracy index and their components are scored from 0 (no freedom) to 10 (highest freedom). Therefore a negative relationship between the combined index and corruption and a positive relationship with individual components and corruption are expected in order to confirm our hypothesis.

The combined democracy index has the expected negative sign but is insignificant. The estimated results for the individual components of democracy show that the coefficients of competition and participation are both positive but only the competition coefficient is significant at the 1 percent level and has a greater magnitude. The effects of individual components and the combined democracy index

[71] These two dimensions of democracy are based on Dahl (1971).

on corruption are somewhat smaller than the results found in the earlier section. Although, it shows that individual components of democracy increase corruption whereas, the combined democracy index reduces corruption. A one standard deviation improvement in the competition indicator increases corruption by 0.55 points. On the other hand, a one standard deviation improvement in combined democracy index reduces corruption by 0.05 points. Overall the alternative measure of democracy confirms the robustness of the results.

Table 6.5 An alternative measure of democracy and corruption, 1995 – 2004

Dependent variable: average corruption perception index	**Competition**	**Participation**	**Combined Index**
Democracy indicator	0.024***	0.006	-0.004
	(0.006)	(0.010)	(0.10)
Observations	98	98	100
Adjusted R^2	0.817	0.794	0.799

Note: Both estimates include a constant as well as all the control variables incorporated in the base equation but not reported here.
White standard errors are in parenthesise. *** indicates significance level at the 1percent level.

6.6 Non-Linear Estimation

The study finds evidence in the earlier sections that narrow-democracy increases corruption and broad-democracy reduces corruption. The results predict the existence of a non-linear relationship between democracy and corruption. Democratisation begins with narrow-democracy and accomplishes maturity with broad-democracy. It is not achievable through an overnight transformation but with a continuous process of democratisation a country can reach a level of democracy where all the components of democracy develop together and exhibits a stronger impact on controlling corruption. To evaluate the possibility more systematically the study re-estimates a non-linear model based on equation (6.3) by utilising panel least squares, and period fixed effect with regional dummies for various components of democracy and the two combined democracy indices. The estimation results are presented in Table 6.6.

Both estimation results confirm the non-linear relationship between democracy and corruption. The democracy and democracy^2 coefficients have the expected positive

and negative signs respectively and are statistically significant at the 1 percent level for all the individual components of narrow-democracy and the two combined indices of broad-democracy. In addition, the inclusion of the second-order polynomial term improves the model's goodness of fit about 7 percent for broad democracy (DEMO2) and about 6 percent for political rights (PR) in the panel least square estimations.[72] The negative sign of the second-degree polynomial democracy indicator reveals that a concave function better fits the data than the simple linear function.[73]

The turning points of the non-linear model where the relationship changes its direction from positive to negative impact on corruption for several democracy indicators are shown in Table 6.7. The results in Tables 6.6 and 6.7 suggest that undemocratic countries with extremely low levels of democracy index values experienced an increase in the corruption level in the early stages of democratisation (for example, East European countries). The corruption level increases until they reach the turning point at which the average level of corruption is at its maximum and once past the turning point corruption level is substantially lower at the mature stages of democracy with consolidated democratic institutions (for example Finland, Denmark, United Kingdom etc).

Comparison of the turning points of various democracy indicators in Table 6.7 demonstrate that as a country moves from narrow-democracy towards a broad-democracy the control of corruption is much faster and stronger. For instance, the estimated turning point of DEMO2 is about 4 which is the lowest level compared with the turning point of over 7 for PR. In other words, the transition stage can be best portrayed as the 'early childhood' of democracy, where transiting countries retain the political rights, but lack the existence of other components of democracy, such as civil liberties, press freedom, legal system, democratic institutions, etc. In the context of democratic transition, Herge et al. (2001) claims that intermediate regimes are less stable than autocracies which in turn, are less stable than democracies.

[72] In PLS estimations, the adjusted R^2 for broad-democracy index increases from 0.756 to 0.812 and the adjusted R^2 for political rights (narrow-democracy) increases from 0.757 to 0.804.
[73] The adjusted R^2 for a cubic function of broad-democracy index decreases compared to the adjusted R^2 of second degree polynomial suggesting that the second degree polynomial best fits the data.

Table 6.6 Estimated results for the non-linear relationship between corruption and various components of narrow-and broad-democracy

Dependent variable: corruption perceptions index										
	(17) **PLS**	(18) **PFERD**	(19) **PLS**	(20) **PFERD**	(21) **PLS**	(22) **PFERD**	(23) **PLS**	(24) **PFERD**	(25) **PLS**	(26) **PFERD**
PR	0.366*** (0.061)	0.285*** (0.049)								
PR^2	-0.027*** (0.036)	-0.020*** (0.003)								
CL			0.430*** (0.045)	-0.236*** (0.050)						
CL^2			-0.035*** (0.003)	-0.017*** (0.003)						
Press					0.624*** (0.066)	0.371*** (0.083)				
$Press^2$					-0.056*** (0.006)	-0.029*** (0.008)				
DEMO1							0.442*** (0.038)	0.257*** (0.55)		
$DEMO1^2$							-0.043*** (0.004)	-0.023*** (0.005)		
DEMO2									0.501*** (0.033)	0.261*** (0.046)
$DEMO2^2$									-0.062*** (0.003)	-0.031*** (0.006)
EF	-0.649*** (0.028)	-0.553*** (0.023)	-0.647*** (0.031)	-0.536*** (0.024)	-0.610*** (0.027)	-0.529*** (0.020)	-0.629*** (0.031)	-0.520*** (0.020)	-0.592*** (0.031)	-0.497*** (0.020)
Log (RGDP)	5.167*** (0.602)	2.441*** (0.579)	4.739*** (0.621)	2.440*** (0.528)	4.278** (0.558)	2.253*** (0.479)	4.268*** (0.679)	2.380*** (0.462)	3.813*** (0.652)	2.419*** (0.464)
$(Log (RGDP))^2$	-0.373*** (0.036)	-0.200*** (0.034)	-0.343*** (0.038)	-0.202*** (0.031)	-0.319*** (0.033)	-0.193*** (0.028)	-0.313*** (0.042)	-0.196*** (0.027)	-0.287*** (0.040)	-0.201*** (0.027)
GINI	0.032*** (0.006)	0.042*** (0.007)	0.024*** (0.005)	0.044*** (0.007)	0.024*** (0.005)	0.045*** (0.006)	0.019*** (0.005)	0.043*** (0.007)	0.018*** (0.005)	0.044*** (0.006)
UNEM	0.018*** (0.005)	0.020*** (0.004)	0.017*** (0.005)	0.019*** (0.004)	0.019*** (0.005)	0.020*** (0.004)	0.016*** (0.005)	0.017*** (0.004)	0.015*** (0.005)	0.017*** (0.004)

Table 6.6 continues

	(17) **PLS**	(18) **PFERD**	(19) **PLS**	(20) **PFERD**	(21) **PLS**	(22) **PFERD**	(23) **PLS**	(24) **PFERD**	(25) **PLS**	(26) **PFERD**
ALR	0.021***	-0.005**	0.021***	-0.005**	0.025***	-0.005**	0.019***	-0.007***	0.019***	-0.007***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.003)	(0.001)	(0.002)
Latin America		1.133***		1.092***		1.079***		1.105***		1.044***
		(0.358)		(0.361)		(0.364)		(0.362)		(0.373)
Middle East		0.935***		0.834**		0.784**		0.874**		0.766*
		(0.384)		(0.412)		(0.399)		(0.386)		(0.401)
East Asia		2.528***		2.391***		2.415***		2.367***		2.250***
		(0.433)		(0.475)		(0.455)		(0.454)		(0.471)
South East Asia		1.550***		1.412***		1.440***		1.456***		1.349***
		(0.363)		(0.392)		(0.370)		(0.371)		(0.387)
South Asia		1.213***		1.202***		1.156***		1.212***		1.215***
		(0.421)		(0.437)		(0.431)		(0.442)		(0.439)
Eastern Europe		2.219***		2.186***		2.212***		2.275***		2.241***
		(0.334)		(0.360)		(0.355)		(0.333)		(0.344)
Central Asia		1.921***		1.637***		1.721***		1.888***		1.756***
		(0.240)		(0.305)		(0.283)		(0.235)		(0.272)
Africa		0.360		0.192		0.155		0.320		0.216
		(0.330)		(0.334)		(0.342)		(0.327)		(0.342)
Western Europe		1.455***		1.408***		1.411***		1.493***		1.469***
		(0.361)		(0.385)		(0.380)		(0.340)		(0.350)
Northern Europe		0.263		0.272		0.328		0.402		0.570*
		(0.352)		(0.380)		(0.354)		(0.334)		(0.313)
North America		0.735***		0.729**		0.703***		0.874***		0.911***
		(0.259)		(0.282)		(0.275)		(0.236)		(0.239)
Australasia		-0.085		-0.088		-0.031		0.057		0.251
		(0.329)		(0.355)		(0.328)		(0.303)		(0.287)
Constant	-11.508***	-1.106	-10.185***	-0.990	-8.931***	-0.474	-7.597***	-0.490	-5.639***	-0.474
	(2.383)	(1.893)	(2.470)	(1.670)	(2.271)	(1.597)	(2.660)	(1.406)	(2.579)	(1.415)
Observations	981	981	981	981	981	981	981	981	981	981
Adjusted R^2	0.804	0.847	0.803	0.844	0.804	0.846	0.807	0.845	0.812	0.845
Wald test (*P*-value)	0.005	0.006	0.008	0.002	0.005	0.002	0.003	0.009	0.001	0.001

Note**:** PR is political rights, CL is civil liberties, Press is press freedom, DEMO1 includes political rights and civil liberties and DEMO2 includes political rights, civil liberties and press freedom. PLS is panel least squares and PFERD is period effect with regional dummies.
White standard errors are in parenthesise. ***, **, * indicate significance level at the 1, 5 and 10 percent, respectively.

They further point out that durable democracy is the most probable end-point of the democratisation process.

Table 6.7 Turning points for the level of various democracy indices

	PR	CL	Press	DEMO1	DEMO2
PLS	6.778	6.143	5.571	5.140	4.04
PFERD	7.125	6.941	6.397	5.587	4.210

Note: PR is political rights, CL is civil liberties, Press is press freedom, DEMO1 includes political rights and civil liberties and DEMO2 includes political rights, civil liberties and press freedom and CPI is the corruption perception index. PLS is panel least squares and PFERD is period effect with regional dummies.

With the continuous process of democratisation a country can reach the probable end-point, where a more extensive democratic freedom and more effective democratic institutions could operate together to achieve a high level of efficiency and effectiveness. Therefore, in an advanced level of democracy countries can retain high levels of political rights, civil liberties and press freedom through strengthening their institutions which could benefit anti-corruption efforts in the advance stages of democratisation. It is interesting to note that the stage of advancement of democracy runs in a direction that is quite evident from the estimated turning points for various democracy indicators in the sample (see Table 6.7). In other words, it can be said that a high level of press freedom is only attainable when a high level of political rights exists but not the other way round. The average values of political rights and press freedom for 100 countries are presented in Appendix Table A.6.4. Table 6.8 confirms the claim that no country is found in the sample where press freedom is high but political right is low.

Table 6.8 Number of countries with high and low levels of political rights and press freedom

Categorisation of the level of democracy indices	No. of countries	Categorisation of the level of democracy indices	No. of countries
High PR High press freedom	54	High PR Low press freedom	11
Low PR High press freedom	0	Low PR Low press freedom	33

Level of 5 or greater indicates a high level whereas less than 5 indicates a low level of political rights.

6.6.1 Partial effects: narrow-and broad-democracy

In order to confirm the non-linear relationship the partial effects of narrow and broad democracy indicators are estimated, that takes the following form.[74]

$$CPI_{i,t} = \alpha_0 + \delta_1 PR_{i,t} + \beta_1 (PR_{i,t} - \mu_1)^2 + \beta_2 EF_{i,t} + \beta_3 \log (RGDP)_{i,t} + \beta_4 (\log (RGDP))^2_{i,t} + \beta_5 GINI_{it} + \beta_6 UNEM_{i,t} + \beta_7 ALR_{i,t} + \varepsilon_{i,t}, \quad (6.4)$$

The coefficient δ_1 measures the partial effect at various levels of political rights on corruption where μ_1 takes the value from 0 to 10 for the political rights index. δ_1 coefficient is altered with DEMO2.

The partial effects results are reported in Table 6.9. Columns (27) and (28) show the partial effects results of political rights (narrow-democracy) on corruption at the different levels of the political rights index (i.e. from 0 to 10) using the panel least squares and period effect with regional dummies estimation methods. Both columns confirm that narrow-democracy enhances corruption at the early stages of democratisation; yet once past the threshold level (i.e. at the political rights level 6-7) corruption levels decrease when a country acquires a greater level of mature democracy. On the other hand, it is evident from columns (29) and (30) that in the case of a broad-democracy, the threshold level is quite low, i.e. corruption starts decreasing at level between 4 and 5. Moreover, the magnitude of the coefficients of DEMO2 are greater than the coefficients of political rights in both the PLS and PFERD estimation methods when democracy reduces corruption. This suggests that broad-democracy manifests a much stronger and significant effect in controlling corruption.

Overall the estimation results presented in Tables 6.6, 6.7 and 6.9 clearly reflect that there exists a non-monotonic relationship between democracy and corruption which is robust to various specifications and the variation of different components of democracy indices, both individual as well as composite. The coefficients of non-linear and partial effects suggest that corruption is slightly lower in autocracy than in narrow-democracy and once past a threshold point corruption is substantially lower

[74] See Wooldridge (2006, pp. 204-206) for details.

in broad-democracies. It is worth noting that combating corruption levels increases with democratic reforms and it is most effective in nations that are advanced, mature and have consolidated broad-democracy.

Table 6.9 Partial effects of narrow-and broad-democracy on corruption

Dependent variable: corruption perceptions index				
Level	(27) **δ_1 (PLS)** **PR=1,2..10**	(28) **δ_1 (PFERD)** **PR=1,2..10**	(29) **δ_1 (PLS)** **DEMO2=1,2..10**	(30) **δ_1 (PFERD)** **DEMO2=1,2..10**
0	0.366***	0.285***	0.570***	0.261***
	(0.032)	(0.049)	(0.033)	(0.046)
1	0.312***	0.244***	0.377***	0.198***
	(0.028)	(0.042)	(0.027)	(0.035)
2	0.258***	0.204***	0.253***	0.136***
	(0.024)	(0.036)	(0.021)	(0.025)
3	0.204***	0.163***	0.129***	0.074***
	(0.020)	(0.029)	(0.016)	(0.016)
4	0.151***	0.123***	0.005	0.011***
	(0.016)	(0.023)	(0.013)	(0.014)
5	0.097***	0.082***	-0.119***	-0.051***
	(0.013)	(0.017)	(0.012)	(0.021)
6	0.043***	0.041***	-0.243***	-0.114***
	(0.012)	(0.012)	(0.015)	(0.030)
7	-0.011	-0.001	-0.368***	-0.176***
	(0.011)	(0.010)	(0.019)	(0.041)
8	-0.064***	-0.039***	-0.492***	-0.238***
	(0.013)	(0.013)	(0.025)	(0.052)
9	-0.119***	-0.080***	-0.616***	-0.301***
	(0.015)	(0.018)	(0.031)	(0.064)
10	-0.173***	-0.120***	-0.740***	-0.363***
	(0.019)	(0.024)	(0.037)	(0.075)

Note: PR is political rights and DEMO2 includes political rights, civil liberties and press freedom and CPI is the corruption perception index. PR and DEMO2 are estimated utilising partial effect with same control variables. PLS is panel least squares and PFERD is period effect with regional dummies.
White standard errors are in parenthesis. ***, **, * indicate the level of significance at the 1percent, 5percent and 10percent, respectively.

6.7 Conclusion

This chapter empirically examines the impact of narrow-democracy and broad-democracy on controlling. The empirical analysis reveals that democratisation eventually reduces corruption although there is an upsurge of corruption in the early stages of democratic process. The results support the hypothesis developed in Chapter 5 that an electoral democracy represented by political rights does not produce sufficient checks against corruption. Instead, it aggravates the level of corruption in transition countries when compared with autocratic regimes. By way of contrast, an advanced mature democracy is capable of restraining corruption levels

significantly. The results remain robust under various estimations and for the alternative measures of democracy and corruption. The non-linear regression results confirm the fact that corruption levels increase in the transition process which are due to the existence of narrow-democracy. However, once past the threshold point corruption level decreases substantially in a broad and mature democracy.

The empirical evidence obtained in this analysis is also coherent with earlier studies. On the one hand it confirms the finding that the number of years of democracy plays an important role in reducing corruption rather than the current levels of democracy. While on the other hand, the results also support the view that the road to democracy is complicated and autocratic countries do not become mature consolidated democracies immediately (overnight). As democratisation is a prolonged process, hence a well-functioning advanced mature democracy requires years to build up. Moreover, this study also corroborates the findings that only political rights play no significant role in curbing corruption. This is because political rights framed as narrow-democracy increases corruption in transition countries. Also, it confirms a non-linearity of democracy-corruption relationship. Thus, despite the high level of corruption among intermediate democracies where democracy is narrowly formed the consolidation of advanced democratic institutions along with political rights, civil liberties and press freedom reduces corruption. Ultimately, the initial narrow-democracy achieves its final democratic ends which significantly lower corruption levels.

The cross-country results also confirm some country specific observations. First, countries known as least corrupt are highly democratic and have been established democracy over an elongated period of time (for example Denmark, New Zealand, Sweden and other developed nations). Second, the historic evidence of transition countries is consistent with the estimated results of narrow-democracy. Third, South Korean evidence supports the non-linear relationship between democracy and corruption.

However, there are some country specific evidences that do not support the usual democracy-corruption relationship and they are treated as outliers in the analysis.

First, the existence of low level of democracy and the very low level of corruption in Hong Kong and Singapore challenges the validity of the negative democracy-corruption association. Second, India as a democratic nation is counted as one of the most corrupt country. The exceptional democracy-corruption relationship in these countries can be explained by another institutional factor i.e., economic freedom. Economic freedom coefficient is found to be negative and highly significant in all the estimations, suggesting that economic freedom has a significant positive effect in controlling corruption. Therefore, it is of interest to examine whether economic freedom works more effectively in controlling corruption in any political environment? To answer this question further analysis is taken to examine the interaction effects between democracy and economic freedom on corruption. Measuring the interaction effect between these two institutional variables on corruption follows in Chapter 7.

APPENDIX 6

This appendix consists of three tables. Table A6.1 presents descriptive statistics of the variables used here. Table A6.2 reports the results of the two-period and three-period panel estimations of the impact of narrow-and broad-democracy in controlling corruption. Table A6.3 presents the average values of political rights and press freedom for 100 countries.

Appendix Table A6.1 Descriptive statistics of the variables

	Mean	Median	Maximum	Minimum	Standard Deviation	Observations
PR	6.232	6.667	10.000	0.010	3.663	982
CL	5.904	6.667	10.000	0.100	3.165	982
PRESS	5.460	5.350	9.500	0.010	2.556	1000
DEMO1	4.776	4.167	10.000	0.001	3.798	982
DEMO2	3.520	2.133	9.500	1.00E-06	3.372	982
CPI	5.553	6.3	10	0	2.6693	1000
EF	5.173	5.13	10	0.725	2.0791	1000
GINI	38.557	37.55	63.7	20	8.9703	1000
ALR	87.812	95.74	100	33.59	16.311	1000
RGDP	9102.44	6463	36341	204	7702.2	1000
UNEM	12.254	9.25	42	0.4	9.8467	1000

Legend: PR is political rights, CL is civil liberties, Press is press freedom, DEMO1 includes political rights and civil liberties, DEMO2 is broad democracy index which includes political rights, civil liberties and press freedom, CPI is corruption perception index, EF is economic freedom index, GINI is gini index, ALR is adult literacy rate, RGDP is real gross domestic product per capita, and UNEM is unemployment rate..

Table A6.2 Impact of narrow-and broad-democracy in controlling corruption

	Three-period panel	Three-period panel	Two-period panel	Two-period panel
PR	0.067*** (0.011)		0.040*** (0.0009)	
DEMO2		-1.23*** (0.008)		-0.136*** (0.010)
Log (RGDP)	-1.015*** (0.043)	-0.942*** (0.043)	-1.039*** (0.0004)	-0.930*** (0.031)
GINI	0.038*** (0.004)	0.028*** (0.004)	0.036*** (0.005)	0.026*** (0.006)
UNEM	0.012** (0.005)	0.018*** (0.006)	0.013*** (0.002)	0.019*** (0.002)
ALR	0.017*** (0.003)	-0.027*** (0.002)	0.019*** (0.002)	-0.027*** (0.001)
EF	-0.692*** (0.018)	-0.527*** (0.006)	-0.645*** (0.006)	-0.511*** (0.005)
Constant	13.947*** (0.368)	12.838*** (0.458)	14.002*** (0.396)	12.779*** (0.593)
Observations	294	294	196	196
Countries	99	99	99	99
Adjusted R^2	0.759	0.764	0.757	0.766

Legend is similar to Table A6.1. Three-periods are 1995-1999, 1998-2000 and 2001-2004. Two- periods are 1995-1999 and 2000-2004.

White standard errors are in parenthesise. ***, **, * indicate significance level at the 1, 5 and 10 percent, respectively.

Table A6.3Average values of political rights and press freedom

Country	Political rights	Press freedom
Albania	5.833	1.292
Algeria	1.667	0.099
Argentina	8.000	3.718
Armenia	4.500	0.932
Australia	10.000	8.970
Austria	10.000	8.380
Azerbaijan	1.667	0.166
Bangladesh	6.667	1.40
Belarus	1.667	0.079
Belgium	10.000	8.185
Bosnia	3.667	0.713
Brazil	7.500	2.942
Bulgaria	9.000	4.328
Canada	10.000	8.440
Chile	8.500	5.598
China	0.100	0.002
Colombia	5.167	1.095
Congo Democratic Republic	0.727	0.021
Cote d' Ivore	1.833	0.189
Croatia	6.667	2.413
Cyprus	10.000	8.200
Czech Republic	10.000	6.686
Denmark	10.000	9.090
Ecuador	7.333	2.821
Egypt	1.667	0.096
Estonia	9.833	6.676
Ethiopia	4.000	0.542
Finland	10.000	8.670
France	10.000	6.795
Georgia	5.667	1.206
Germany	10.000	7.540
Ghana	7.333	2.613
Greece	10.000	5.103
Guatemala	6.000	1.280
Hong Kong		6.680
Hungary	10.000	6.108
Iceland	10.000	8.920
India	8.000	2.894
Indonesia	4.030	0.939
Iran	1.667	0.049
Iraq	0.100	4.951
Ireland	10.000	8.200
Israel	10.000	4.860
Italy	10.000	6.320
Japan	10.000	6.725
Jordon	4.167	0.826
Kazakhstan	1.667	0.1806

Table A6.3 continues

Country	Political rights	Press freedom
Kenya	2.687	0.486
Kuwait	4.333	0.721
Kyrgyzstan	3.000	0.491
Latvia	9.667	6.333
Lithuania	9.833	6.519
Luxemburg	1.000	8.900
Macedonia	5.833	2.168
Malaysia	4.000	0.496
Malta	10.000	8.360
Malta	7.333	3.017
Mexico	7.167	2.611
Moldova	7.167	1.201
Morocco	3.333	0.624
Myanmar	0.100	1.998
Netherlands	10.000	8.550
New Zealand	10.000	9.240
Nigeria	3.197	0.655
Norway	10.000	9.350
Oman	1.667	0.122
Pakistan	3.010	0.419
Peru	6.000	1.978
Philippines	8.333	3.525
Poland	10.000	6.635
Portugal	10.000	8.380
Qatar	1.040	0.077
Romania	7.833	3.585
Russia	4.500	0.822
Saudi Arabia	0.100	0.002
Serbia	6.667	0.667
Singapore	3.500	0.461
Slovakia	9.333	4.958
Slovenia	10.000	6.637
South Africa	10.000	6.142
South Korea	8.500	5.147
Spain	10.000	7.188
Sri Lanka	6.500	1.410
Sudan	0.100	0.001
Sweden	10.000	9.050
Switzerland	10.000	9.140
Syria	0.100	0.001
Taiwan	8.500	5.365
Tajikistan	1.353	0.052
Tanzania	4.333	1.146
Thailand	7.833	3.392
Turkey	5.333	0.878
Turkmenistan	0.100	0.001
Ukraine	5.833	1.393
United Arab Emirates	1.667	0.122

Table A6.3 continues

Country	Political rights	Press freedom
United Kingdom	10.000	7.083
United States	10.000	8.610
Uzbekistan	0.100	0.003
Venezuela	7.000	2.221
Vietnam	0.100	0.002
Yemen	3.000	0.209

Source: Freedom House, http://www.freedomhouse.org.
Note: A higher value represents a higher freedom.

CHAPTER 7

The Interactive Effect of Economic Freedom and Democracy on Corruption

7.1 Introduction

In examining the causes of corruption variation across countries, Chapter 4 finds that an expansion of democracy encourages corruption. The finding contradicts the observed performance in many democratic countries that experience low levels of corruption. However, the result of the positive effect of democracy on corruption in Chapter 4 elucidates the incidence of corruption in the newly sovereign countries. To resolve the debate of the paradoxical relationship between democracy and corruption Chapters 5 analyses the relationship theoretically and Chapter 6 tests the results in an empirical framework. Both theoretical and empirical results confirm the existence of a non-monotonic relationship between democracy and corruption. However, the incidence of outliers in countries such as Hong Kong and Singapore show a very low level of democracy and a very low level of corruption. This provides a challenge as it may affect the empirical results presented in other studies given the incidence of outlier issues of these countries. Thus, this chapter examines the relationship in outlier countries with another crucial institutional factor, viz. economic freedom and its interaction effect with democracy to measure its impact on corruption.

The focus on competition and its impact on corruption have been noted from two different perspectives. One is the political liberalisation or democratisation and the other is the economic liberalisation or decentralisation. For explaining the relationship between democratisation and corruption studies have used trade openness, government size, government intervention, or the composite economic freedom index as control variables (see studies by Treisman (2000), Montinola and Jackman (2002), Chowdhury (2004), Bohara et al. (2004) and Shen and Williamson (2005)). The political rights and/or civil liberties have been used as control variables in the studies by Ades and Di Tella (1999) and Fisman and Gatti (2002) which focus

on the effect of economic liberalisation on corruption. Furthermore, Emerson (2006) uses civil liberties that act as an instrumental variable for describing the effect of corruption on competitiveness.

To the best of our knowledge, there is no cross-country study which captures the interaction effect of democracy and economic freedom on corruption.[75] It is certainly of interest to ask how these two factors work together in affecting corruption. As examined in Chapter 5 it is seen that narrow-democracy does not reduce corruption. Thus, what is the role of these two factors of democracy and economic freedom on corruption? And, does economic freedom work more or less effectively in controlling corruption in an environment that enjoys political freedom?

This study provides a systematic examination of the interaction between democracy and economic freedom and its impact on corruption. It differs from earlier literature as this study explicitly examines this interaction effect on corruption. The broad-democracy index developed in Chapter 6 is used to measure democracy and economic freedom is measured by using the composite economic freedom index (constructed in Chapter 4). In a systematic examination of the hypotheses the study quantifies cross country panel estimations for 100 nations over the period 1995 to 2004.

The chapter is organised as follows: the next section briefly outlines an overview of the relationship between democracy and economic freedom with corruption. Section 7.3 sets out the basic model addressing the hypotheses being examined. Section 7.4 discusses the empirical models and methodology utilised followed by the panel estimation results for various specifications in section 7.5. Section 7.6 presents conclusions.

7.2 Economic-Political Liberalisation and Corruption: An Overview

In defining the causes of corruption several economists argue that lack of competition fosters corruption. The rent-seeking literature by Krueger (1974) sets the

[75] Studies of Gounder (2002) have utilised the interactive effect of democracy and economic freedom on growth.

scene of the corruption activities in the political economy context. Krueger (1974) points out that in many market-oriented economies, government restrictions on economic activities give rise to rents in a variety of forms. Therefore, people often compete for the rents, thus giving rise to varying amounts of corruption. Rose-Ackerman (1978, p.138) first suggested that competition between officials keeps the level of bribe relatively low and may eliminate bribery entirely due to the possibility of overlapping jurisdictions. When competition lowers the level of prevailing bribe-prices then some officials may drop out of a corrupt system because of low returns. The honesty of some officials may push the market-clearing bribe-price still lower, inducing other officials to give up corruption. Fisman and Gatti (2002) argue that models which emphasise interjurisdictional competition or direct monitoring of bureaucrats generally favour decentralisation, while those that focus on coordination of rent-seeking or bureaucratic competition often take a negative view of decentralisation.

Brennan and Buchanan (1980) emphasise that analogous to the effect of competition in product markets, political competition reduces the ability of bureaucrats to extract rents in exchange for services. In contrast, Shleifer and Vishny (1993) discuss the effect of decentralisation on corruption with the idea of double marginalisation. Although decentralisation leads to greater dispersion of government decision-making powers, the lack of coordination among bureaucrats in extracting bribes may lead to excess rent extraction, in much the same manner that successive monopolies result in a total price markup above the monopoly level. Treisman's (2000) empirical study finds that federalist countries have higher rates of corruption. Theoretically competition takes place between government officials who possess discretionary power to deliver the public goods, as well as between firms in the economy. More competition in the economy reduces the level of profits or rents so that officials have less incentive to engage in corruption (Ades and Di Tella, 1999). Other studies also support the view that greater state control leads to the possibility of high levels of corruption, see for example Ades and Di Tella (1997), Mauro (1997), Kaufman (1997) and Acemoglu and Verdier (2000).

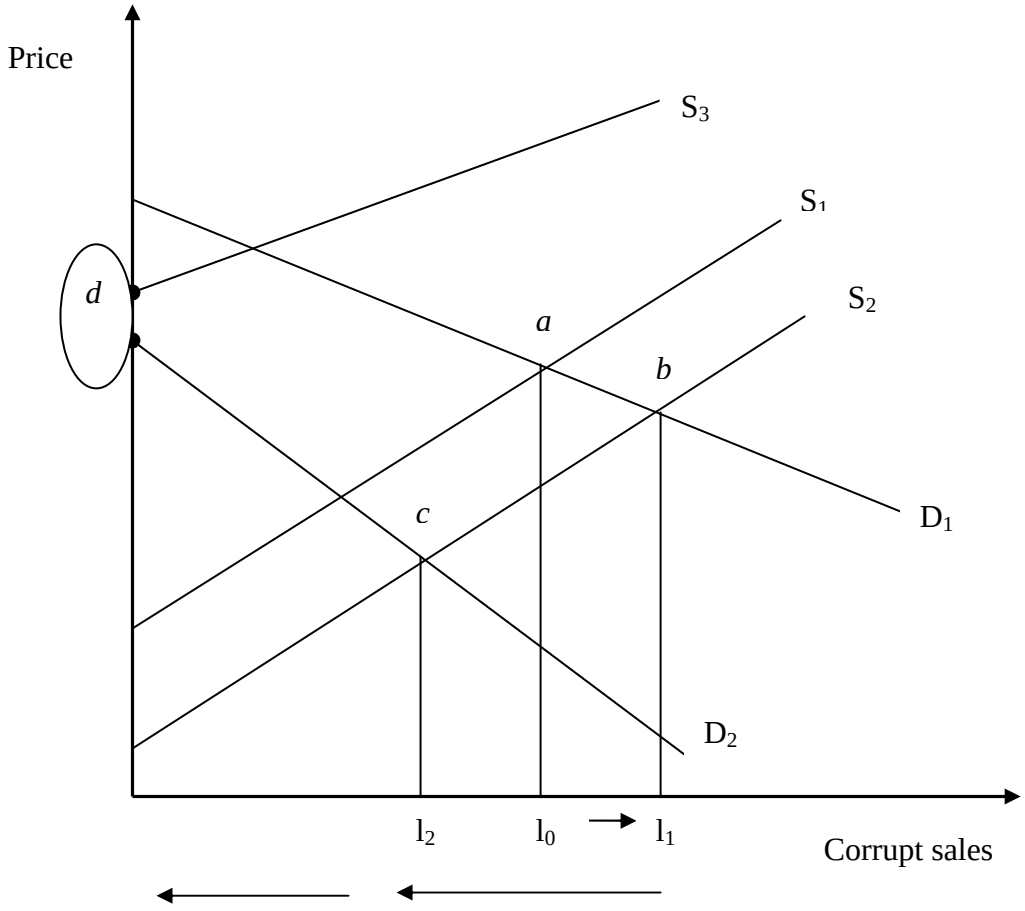
As the existing literature predicts, the ambiguous impact of competition between officials and/or between firms on corruption this study attempts to construct a simple demand-supply model of competition and corruption that builds on the aforementioned studies. The level of corruption is determined jointly with an interaction of the level of political and economic competition. On the one hand, corrupt agents who are in charge of licensing and regulation in the industrial sector restrict the number of firms for their own interest. On the other hand, corruption flourishes in the absence of efficient monitoring and a more democratic government, and the citizens' involvement in governance leads to more careful monitoring of agents which in turn have a depressing effect on the level of rent-seeking behaviour of the bureaucrats. The empirical section tests whether the combined effects of democracy and economic freedom reduce corruption and its subsequent implications on the economy.

7.3 Demand-Supply Analysis of Democracy, Economic Freedom and Corruption

The impact of political and economic liberalization on corruption is described diagrammatically using the demand and supply curve shown in Figure 7.1. The interactions between the government and private agents provide the basis for the model. It is assumed on the one hand that there exists building inspectors in a big city who are agents of the government and provide approvals for building construction. On the other hand, property developers as private agents undertake investment projects but need approvals from the building inspectors to operate. Corruption occurs when a government agent demands a bribe from a private agent in return for the permit. For simplicity, the nature of the bribe is to allow the property developments to be approved right away (abstracting from 'good' vs. 'bad' proposed developments). It implies that 'bad' ones would not be approved, i.e. not looking at the bribe needed to get 'bad' projects approved. Each building inspector chooses a bribe to charge to a property developer who applies for a permit from his/her office. The supply curve (S_1) represents the number of approvals of building permits in the city obtained with a bribe. The upward slope of the supply curve reflects that each inspector has a different minimum amount of payment required for a bribe to be accepted. All of the inspectors know that there is a probability of being caught, if not

now, then in the future. The inspectors differ from each other in that they have different levels of aversion to the prospect of being caught.

Figure 7.1 The optimum level of corruption in various level of democracy



The starting point in which the present study is interested is the supply curve during autocracy. The supply curve S_1 being associated with the autocratic government does not necessarily represent a corruption monopoly where the inspectors co-operate, rather they are relatively small in number and are the friends and relatives of the autocrat and are in his/her smaller inner circle. The downward sloping demand curve (D_1) illustrates private agents' willingness to pay for a permit and if the market price is low, there are a lot of people who are willing to pay. The equilibrium level of corruption (l_0) during autocracy is at point (*a*) where the demand curve (D_1) and the supply curve (S_1) intersect.

Now, the transformation towards democracy increases the number of inspectors in the market which shifts the supply curve from S_1 to S_2. The move towards this transition represents a far wider group (coalition government perhaps) making their friends and relatives building inspectors. The rightward shift of the supply curve increases the level of corruption to (l_1) during democratisation.

Over time, with democratisation, there exists a free society where buyers become better informed and seek out inspectors who provide permits without a bribe. Also, acquisition of economic freedom reduces the demand for buying illegal favouritism because it promotes free economic activities of the private agents or general public. Thus, at any given price fewer buyers are prepared to pay the bribe and the demand curve shifts to the left with an equilibrium level of corruption (l_2). In addition, the advanced stage of democratic institutions ensures political and civil rights of the citizens that expose the corrupt behaviours and increase the probability of being caught. The supply curve shifts towards (S_3) and the new corruption free equilibrium achieved at point (*d*). Overall the transition towards democracy increases corruption level from (l_0) to (l_1) and further democratisation along with economic freedom reduces the corruption level to l_2. It is seen that the joint effect of democracy and economic freedom reduces corruption significantly. Moreover, for a given level of democracy, greater economic freedom decreases corruption. These issues are tested empirically below.

7.4 Empirical Models and Methodology

The main purpose of the empirical analysis is to present some evidence on the overall structure of the interaction effect of democracy and economic freedom on corruption. The key implications of the model require testing of whether the joint interactive term reduces corruption. The models and methodologies used in the empirical analysis are discussed next.

7.4.1 Models with the interaction term

To measure whether and by how much democracy and economic freedom matter to influence corruption, the model is specified as:

$$CPI_{i,t} = \beta_0 + \beta_1 DEMO2_{i,t} + \beta_2 EF_{i,t} + \beta_3 DEMO2_{i,t}*EF_{i,t} + \beta_4 \log (RGDP)_{i,t} + \beta_5 (\log (RGDP))^2_{i,t} + \beta_6 GINI_{i,t} + \beta_7 UNEM_{i,t} + \beta_8 ALR_{i,t} + \varepsilon_{i,t}, \quad (7.1)$$

where ε is error term, i is country, t is time, DEMO2 is broad-democracy index, EF is economic freedom index and CPI is corruption perception index. The DEMO2*EF is an interaction variable between democracy and economic freedom indices. The descriptive statistics of the variables are reported in Appendix Table A7.1. The coefficient β_3 captures the interaction effect which is the main focus in this chapter. In addition, the partial effect of democracy (economic freedom) on corruption is computed as follows:

$$\Delta CPI_{i,t} / \Delta DEMO2_{i,t} = \beta_1 + \beta_3 EF_{i,t} \quad (7.2a)$$

$$\Delta CPI_{i,t} / \Delta EF_{i,t} = \beta_2 + \beta_3 DEMO2_{i,t} \quad (7.2b)$$

If $\beta_3 < 0$, then equation (7.2a) implies that a one percentage point increase in the democracy index yields a greater reduction in the level of corruption with a higher level of economic freedom. Similarly if $\beta_3 < 0$, then a one percentage point increase in the economic freedom index shown in equation (7.2b) yields a greater reduction in the level of corruption with a higher level of democracy. In summerising the effect of democracy and economic freedom, equations (7.2a and 7.2b) must be evaluated at various values of economic freedom and democracy, such as the mean value, or the lowest and highest values of the indices in the sample.

7.4.2 Methodology

To estimate the interaction effect panel estimation methodologies are used based on equation (7.1), (7.2a) and (7.2b) for the period 1995 to 2004. In order to deal with the possibility of heteroskedasticity the standard errors are white-corrected. For the robustness checks two-way fixed effects (country and period), period fixed effects with regional dummies and two-way random effects (RE) are estimated. As an alternative econometric methodology the study also uses ordinary least square (OLS) for the average period 1995-2004 as a single period. In addition, two-stage least

square (2SLS) are also utilised to estimate the equations. These methods also verify the sensitivity analysis of the results obtained using panel estimations.

In order to interpret the impact of democracy and economic freedom on corruption the partial effects are also estimated based on equations (7.2a) and (7.2b).[76] The model is estimated using the following form:

$$CPI_{i,t} = \alpha_0 + \delta_1 DEMO2_{i,t} + \delta_2 EF_{i,t} + \beta_3 (DEMO2_{i,t} - \mu_1)*(EF_{i,t} - \mu_2) + \beta_4 \log (RGDP)_{i,t} + \beta_5 (\log (RGDP))^2_{i,t} + \beta_6 GINI_{i,t} + \beta_7 UNEM_{i,t} + \beta_8 ALR_{i,t} + \varepsilon_{i,t}, \quad (7.3)$$

where μ_1 and μ_2 take values from 0 to 10. The coefficient δ_1 measures the partial effect of democracy on corruption when μ_2 takes the value from 0 to 10 for the economic freedom index. The coefficient δ_2 represents a similar interpretation for economic freedom as that of δ_1.

7.5 Empirical Evidence

The scatter plots of economic freedom in both less and more democratic countries are shown in Figure 7.2. Economic freedom and democracy variables are highly correlated with each other for the more democratic countries with a mean democracy index value of 3.52 or more (1995-2004). However, for the less democratic countries the correlation is weak with a score of less than 3.52 (1995-2004).

The relationship between economic freedom and the level of corruption in both less democratic and more democratic countries is shown in Figure 7.3. It is apparent that economic freedom and the level of corruption are highly correlated for both the less and more democratic countries, and the relationship is strong for more democratic countries. In other words, it can be said that the effect of economic freedom on corruption is greater in more democratic countries. Therefore, to examine the impact of economic freedom on corruption in the less and more democratic countries rigorously an interaction term of economic freedom (EF) and democracy (DEMO2) is included. These relationships and their impact on corruption are examined

[76] See Wooldridge (2006, pp. 194-95) for details.

utilising various estimation methods. The focus of the estimated coefficient on the interaction term (DEMO2*EF) is based on equations (7.2a) and (7.2b).

Figure 7.2 Levels of economic freedom in less and more democratic countries

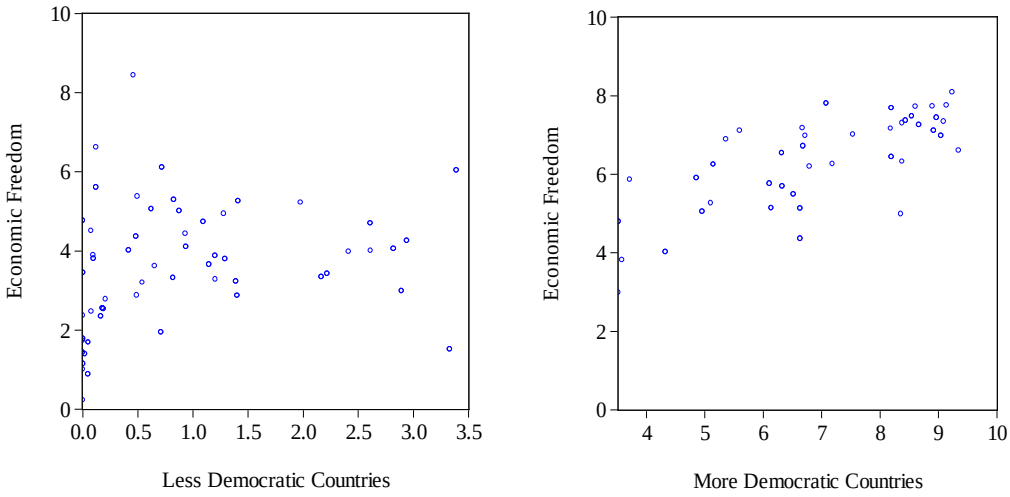
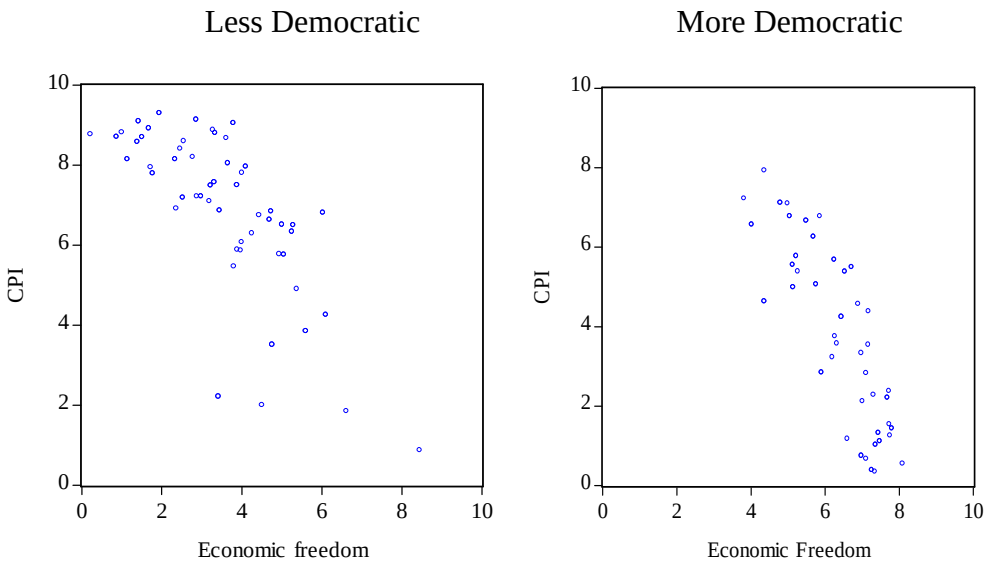


Figure 7.3 Economic freedom and corruption: less and more democratic countries



Note: CPI is corruption perception index.

The panel least squares (PLS) results are reported in Table 7.1. The interaction effect (column (1)) of economic freedom on corruption at the mean score of democracy of

3.52 is -1.065 which is highly significant.[77] It suggests that a one standard deviation increase in economic freedom reduces corruption by 2.22 points, some 0.83 standard deviations in the corruption index at the mean democracy score of 3.52.[78] On the other hand, the interaction effect of democracy on corruption at the mean economic freedom score of 4.83 is -0.01.[79] In other words, a one standard deviation increase in democracy index reduces corruption by 0.03 points, or 0.01 standard deviations in the corruption index at the mean economic freedom score of 4.83.[80] The results indicate that the interaction effect of economic freedom has a significant impact on controlling corruption; however, the interaction effect of democracy is not significant. Moreover, economic freedom shows a much stronger effect than democracy at the average value of both these indices. The results support the view that economic freedom reduces corruption at any level of democracy, while democracy has a mixed effect. If a country has better than average economic freedom then more democracy is associated with less corruption. But if a country has less economic freedom then more democracy is associated with more corruption. The results of these two interactive factors are interpreted in detail in the partial effect estimation, in sub-section 7.5.2.

Column (2) estimates the interaction effect by incorporating the standard control variables (i.e. log (RGDP), $(\log (RGDP))^2$, ALR, UNEM, GINI) using the PLS method. The result shows that the significance and the sign of the interaction effect of economic freedom on corruption remain unchanged when other economic control variables are included. In contrast, the interaction effect of democracy increases corruption although the effect is not significant. The nonlinear relationship between income per capita and corruption is also significant. The other control variables such

[77] The estimated effect is calculated as follows: [- 0.721(coefficient of EF) - 0.098 (coefficient of the interaction term)* 3.52 (mean score of democracy) = - 1.065].
[78] A one-standard-deviation increase of economic freedom index is calculated by multiplying the coefficient of interaction effect (1.065) and the standard deviation of EF i.e., 2.0971, which gives 2.22 points. It can also be explained by 2.22/2.669 (standard deviation of corruption perception index) equals to 0.83 points of a standard deviation of CPI.
[79] The estimated effect is calculated as follows: 0.463 (coefficient of DEMO2) - 0.098 (coefficient of the interaction term)* 4.83 (mean score of EF) = -0.01.
[80] A one-standard-deviation increase of democracy index is calculated by multiplying the coefficient of interaction effect (0.01) and the standard deviation of DEMO2 i.e., 3.372, which gives 0.03 points. It can also be explained by 0.03/2.669 (standard deviation of corruption perception index) equals to 0.01 points of a standard deviation of CPI.

Table 7.1 Interactive effects of democracy and economic freedom on corruption: panel estimation

Dependent variable: corruption perceptions index					
	(1) **PLS**	(2) **PLS**	(3) **PFERD**	(4) **FE**	(5) **RE**
DEMO2	0.463*** (0.061)	0.286*** (0.036)	0.066** (0.033)	0.139* (0.080)	0.008 (0.070)
EF	-0.721*** (0.036)	-0.455*** (0.024)	-0.461*** (0.024)	-0.026 (0.046)	-0.142*** (0.054)
DEMO2*EF	-0.098*** (0.009)	-0.048*** (0.006)	-0.008 (0.006)	-0.030*** (0.012)	-0.008 (0.011)
Log (RGDP)		4.697*** (0.694)	2.733*** (0.534)	-0.851 (1.456)	3.713** (1.763)
$(\text{Log (RGDP)})^2$		-0.349*** (0.043)	-224*** (0.032)	-0.080 (0.078)	-0.280*** (1.04)
GINI		0.025*** (0.005)	0.045*** (0.007)	0.118*** (0.014)	0.086*** (0.008)
UNEM		0.017*** (0.005)	0.018*** (0.004)	0.002 (0.005)	0.013 (0.008)
ALR		0.025*** (0.001)	-0.003 (0.002)	-0.034*** (0.010)	0.007 (0.010)
Latin America			1.001*** (0.363)		
Middle East			0.649 (0.419)		
East Asia			2.275*** (0.476)		
South East Asia			1.255*** (0.399)		
South Asia			1.257*** (0.435)		
Eastern Europe			2.163*** (0.372)		
Central Asia			1.526*** (0.430)		
Africa			0.116 (0.352)		
Western Europe			1.278*** (0.400)		
Northern Europe			0.107 (0. 384)		
North America			0.563** (0.288)		
Australasia			-0.294 (0.359)		
Constant	9.563*** (0.145)	-9.702*** (2.677)	-1.739 (1.649)	2.982 (7.032)	-8.542 (6.831)
Observations	981	978	978	978	978
Adjusted R^2	0.724	0.798	0.842	0.957	0.33
Wald test (*P*-value)	0.005	0.002			0.001
F-statistic			180.216	189.707	

Note: PLS is panel least squares, PFERD is period fixed effect with regional dummies, FE is fixed effects and RE is random effect.

White standard errors are in parenthesise. ***, **, * indicate significance level at the 1percent, 5 percent and 10 percent, respectively.

as higher employment rate and income equality have the expected signs which significantly reduce the extent of corruption.

A potential source of concern is the incidence of omitted variables. The results may reflect the influence of time invariant variables not included in the regressions and that may affect the dependent and explanatory variables. Column (3) deals with this possibility by controlling period effects with 12 regional dummies, and column (4) controls for country and period fixed effects (FE). In both cases, despite varying the magnitude of the coefficients of PLS results (i.e. columns (1) and (2)), all coefficients have the same sign. Controlling for the fixed effects, the estimated coefficients for democracy and interaction term are both significant (as noted above), however economic freedom is not statistically significant. The next step estimates the two-way random effects (column (5)) to capture the influence of unobserved factors that may produce heterogeneity across the countries. The sign remains the same for the interaction effect of democracy and economic freedom on corruption although it is insignificant. The Hausman test report suggests that random effects are appropriate to tackle the problem of corruption than fixed effects.[81]

Overall, it is noted that economic freedom has a significant impact on controlling corruption in any political environment, and this effect is stronger when democratic freedom is added. However, the most robust relationship between democracy, economic freedom and corruption is the opposite effect of democracy on corruption for below and above average values of economic freedom. The results suggest that democracy is effective in controlling corruption only when economic freedom is above its average value of 4.83.

7.5.1 Robustness analysis

To address the issue of the robustness of the above results, the basic regressions are re-estimated using ordinary least square (OLS) methodology for the period 1995-2004. Table 7.2 reports the results of OLS estimation with the standard control variables in columns (6), (7) and (8). These results confirm the evidence of the panel regressions (i.e. columns (1)–(5)).

[81] The estimated Hausman test *p*-value of 0.8 suggests that random effects are better than fixed effects.

Table 7.2 Interactive effects of democracy and economic freedom on corruption: OLS and 2SLS estimation

Dependent variable: corruption perceptions index						
	(6) **OLS**	(7) **OLS with regional dummies**	(8) **OLS**	(9) **2SLS**	(10) **Control of corruption index (CCI) (2SLS)**	(11) **Control of corruption index (CCI) (OLS)**
DEMO2	0.423*** (0.163)	0.373** (0.187)	0.367** (0.165)	0.566* (0.312)	-0.444* (0.238)	-0.149 (0.105)
EF	-0.553*** (0.084)	-0.551*** (0.110)	-0.603*** (0.103)	-0.837** (0.361)	0.587** (0.295)	0.352*** (0.093)
DEMO2*EF	-0.066*** (0.024)	-0.055** (0.028)	-0.047* (0.025)	-0.087 (0.061)	0.10** (0.047)	0.049** (0.021)
Log (RGDP)	4.205*** (1.347)	2.634* (1.582)	4.482*** (1.419)	0.447 (7.416)	3.729 (5.556)	-1.827 (1.655)
$(\text{Log (RGDP)})^2$	-0.313*** (0.088)	-0.208** (0.102)	-0.332*** (0.092)	-0.061 (0.476)	-0.202 (0.356)	0.162 (0.106)
GINI	0.021 (0.016)	0.031 (0.019)	0.019 (0.016)	0.028 (0.019)	-0.030** (0.014)	-0.023** (0.011)
UNEM	0.014 (0.014)	0.019 (0.012)	0.011 (0.014)	0.008 (0.017)	0.001 (0.014)	-0.005 (0.009)
Literacy Rate	0.024*** (0.008)	0.006 (0.009)	0.017** (0.008)	0.022* (0.012)	-0.022** (0.011)	-0.023*** (0.006)
Asia		0.834** (0.397)				
Latin America		0.405 (0.519)				
Africa		-0.284 (0.464)				
Eastern Europe		0.944** (0.412)				
(Imports/GDP) (%)			0.005 (0.005)			
Percent Protestant			-1.398*** (0.472)			
British Colony			-0.313 (0.259)			
Constant	-7.473 (5.234)	-1.186 (6.428)	-7.723 (5.573)	7.212 (28.035)	-12.458 (20.963)	9.029 (6.151)
Observations	99	99	97	99	99	99
Adjusted R^2	0.844	0.856	0.857	0.825	0.894	0.894
Serial Correlation test (*P*-value)	0.969	0.566	0.962			0.506
Normality test (*P*-value)	0.862	0.976	0.967			0.918
Heteroskedasticity test (*P*-value)	0.522	0.573	0.697			0.350
Number of instruments				8	8	
Over-identifying restrictions test, *P*-value				0.975	0.993	

Note: OLS is ordinary least square and 2SLS is two stage least square.
White standard errors are in parenthesise. ***, **, * indicate significance level at the 1 percent, 5 percent and 10 percent, respectively.

Another concern is that the estimates might suffer from the endogeneity bias. For example, corrupt public officials might be reluctant to allow economic liberalisation, as this would reduce their ability to extract rents. It is also plausible that economic freedom is subject to mis-measurement problems, which would result in an attenuation bias in the OLS coefficients. In order to correct for these potential problems, following Fisman and Gatti (2002), legal systems of the countries (constructed by Faculty of Law, (Civil Law Section) University of Ottawa) are utilised as instrumental variables.[82] Two dummy variables (i.e. common law and mixed law system) that classify different legal systems are used to reflect that a country's legal system performs well in the case of decentralisation. The legal systems affect corruption through its influence on centralisation, which is consistent with the reasoning by Fisman and Gatti (2002) and Ranjan and Zingales (1999). They argue that corruption directly affects financial development given the importance of legal protection in stimulating financial markets. Moreover, La Porta et al. (1998) claims that legal origin influences capital market development directly through its relationship to the extent of investor rights.[83]

The estimated two stage least square (2SLS) coefficients for democracy, economic freedom and the interaction term in column (9) are much larger than the corresponding OLS estimates in column (6). With the control variables the magnitude of the coefficient of economic freedom increases from 0.553 to 0.837, the coefficient of democracy increases from 0.423 to 0.566 and the coefficient of the interaction term increases from 0.066 to 0.087 (OLS vs. 2SLS). The coefficients of democracy and economic freedom remain significant but the interaction term is insignificant.

In columns (10) and (11), the control of corruption indicator constructed by Kaufmann et al. (2005) is used as the dependent variable. Instead of CPI, the control of corruption index (CCI) for 1996-2004 has been regressed with democracy, economic freedom, interaction term and the controlled variables using both the 2SLS

[82] See http://www.droitcivil.uottawa.ca/world-legal-systems/eng-tableau.php for details.

[83] Following the methodology in Chapter 4, 2SLS estimation here also considers the endogeneity of log real GDP per capita and to obtain unbiased estimate for economic development indicator, infant mortality rate (INFM) and clean sanitation (SAN) are used as instruments.

and OLS. The results confirm that the interaction term has a positive and significant impact, i.e. the interaction between democracy and economic freedom increases the level of corruption control. The estimated results for democracy, economic freedom and the interaction term are consistent with columns (6), (7) and (8), where CPI is used as a dependent variable. The 2SLS estimated coefficients for democracy and economic freedom are always larger than the corresponding OLS estimates regardless of which corruption measure has been used, whereas the magnitude of the interaction term is smaller than the OLS estimates when CCI is used.

In summary, the set of legal system dummies perform well from a statistical perspective. The over-identifying restriction test in columns (9) and (10) (Table 7.2) cannot reject the hypothesis of no correlation between the instruments and the error term in the regression of interest. The 2SLS results (column (9)) confirm the findings of the PLS and OLS results for interaction term between democracy and economic freedom which has a negative impact on corruption. In other words, the combined effect of democracy and economic freedom reduces the level of corruption.

7.5.2 Partial effect

The preceding section has shown the interaction effect of democracy and economic freedom for controlling corruption. Given that economic freedom reduces corruption throughout but democracy has a mixed effect, this section estimates the interaction effect of democracy and economic freedom at each level of democracy and economic freedom indices starting from 0 to 10 based on equation (7.3). The results are reported in Table 7.3.

Columns (12) and (13) in Table 7.3 report the results of the partial effect of democracy on corruption at different levels of economic freedom (i.e. 0 to 10) with respect to the PLS and FE. The estimated coefficient of 0.286 of the interaction term at EF = 0 in column (12) indicates that in the absence of economic freedom in a country a one standard deviation increase in democracy increases corruption by

0.964 points, or 0.36 standard deviations in the corruption index.[84] In contrast, in countries with full economic freedom (i.e. EF = 10) a one standard deviation increase in democracy reduces corruption by 0.658 points.[85]

Table 7.3 Partial effects of democracy and economic freedom on corruption

Dependent variable: corruption perceptions index				
Level	(12) **δ_1 (PLS) EF = 0,1,2..10**	(13) **δ_1 (FE) EF = 0,1,2..10**	(14) **δ_2 (PLS) DEMO2 = 0,1,2..10**	(15) **δ_2 (FE) DEMO2 = 0,1,2..10**
0	0.286*** (0.036)	0.139* (0.080)	-0.455*** (0.030)	-0.026 (0.046)
1	0.238*** (0.031)	0.109 (0.068)	-0.503*** (0.031)	-0.057 (0.036)
2	0.190*** (0.026)	0.079 (0.056)	-0.555*** (0.029)	-0.087*** (0.028)
3	0.141*** (0.022)	0.049 (0.044)	-0.599*** (0.033)	-0.117*** (0.023)
4	0.093** (0.018)	0.018 (0.033)	-0.647*** (0.038)	-0.147*** (0.025)
5	0.045*** (0.016)	-0.012 (0.023)	-0.695*** (0.042)	-0.177*** (0.031)
6	-0.003 (0.016)	-0.042*** (0.015)	-0.743*** (0.047)	-0.207*** (0.041)
7	-0.051*** (0.018)	-0.072** (0.016)	-0.791*** (0.053)	-0.238*** (0.051)
8	-0.099*** (0.021)	-0.102*** (0.024)	-0.840*** (0.058)	-0.268*** (0.062)
9	-0.147*** (0.026)	-0.132*** (0.035)	-0.888*** (0.063)	-0.298*** (0.074)
10	-0.195*** (0.031)	-0.162*** (0.046)	-0.936*** (0.069)	-0.328*** (0.086)

Note: PLS is panel least square and FE is fixed effects, EF is economic freedom and DEMO2 includes political rights, civil liberties and press freedom..
White standard errors are in parenthesis. ***, **, * indicate the level of significance at the 1 percent, 5 percent and 10 percent, respectively.

Both PLS and FE results show that democracy increases corruption when the level of economic freedom is very low; yet once past the threshold point (i.e. between 5 and 6), corruption is substantially lower as the economy becomes more economically free. The threshold point is where economic freedom index is between 5 and 6. Also, it is worth noting that, according to the FE result, the effect of

[84] A one-standard-deviation increase of democracy index is calculated by multiplying the coefficient of DEMO2 (0.286) and the standard deviation of DEMO2 i.e., 3.372, which gives 0.964 points. It can also be explained by 0.964/2.669 (standard deviation of corruption perception index) equals to 0.36 points of a standard deviation of CPI.

[85] A one-standard-deviation increase of democracy index is calculated by multiplying the coefficient of DEMO2 (0.195) and the standard deviation of DEMO2 i.e., 3.372, which gives 0.658 points.

democracy is significant only when the degree of economic freedom is either very low (0 or less) or very high (6 or higher) but in opposite directions. This suggests that democracy is vital for reducing corruption but only in the right environment. In contrast, when economic freedom is almost non-existent, democracy may increase corruption.

Columns (14) and (15) show the effect of economic freedom at various level of democracy ranging from 0 to 10. In countries with autocracy, a one standard deviation increase in economic freedom reduces corruption by 0.946 points, or 0.35 standard deviations in the corruption index in column (14).[86] In contrast, in countries with mature democracy (i.e. DEMO2 = 10) a one standard deviation increase in economic freedom reduces corruption by 1.946 points, some 0.73 standard deviations in the corruption index.[87] It suggests that economic freedom alleviates corruption in any political environment yet it becomes more effective when the level of democracy increases. Columns (12) and (14) are diagrammatically represented in Figure 7.4. It is obvious that economic freedom is more effective in combating corruption.

From the above results some observations regarding country-specific examples can be noted for various cases. First, if economic freedom already exists in a country then democratisation will accelerate the process of combating corruption. For example, an increase in civil liberties and press freedom in China is seen to reduce the level of corruption from 7.8 in 1995 to 6.6 in 2004.[88] Second, if democracy already exists in a country then economic liberalisation increases corruption at the early stages of transformation. For example, in the case of India, which has been a democracy for over sixty years, it is seen that India is quite corrupt even though

[86] A one-standard-deviation increase in economic freedom index is calculated by multiplying the coefficient of EF (0.455) and the standard deviation of EF i.e., 2.079, which gives 0.946 points. It can also be explained by 0.946/2.669 (standard deviation of corruption perception index) equals to 0.35 points of a standard deviation of CPI.

[87] A one-standard-deviation increase in economic freedom index is calculated by multiplying the coefficient of EF (0.936) and the standard deviation of DEMO2 i.e., 2.079, which gives 1.946 points. It can also be explained by 0.964/2.669 (standard deviation of corruption perception index) equals to 0.73 points of a standard deviation of CPI.

[88] A higher value of CPI indicates a high level of corruption.

economic liberalisation started in 1991. The corruption level increases from 6.33 for the period 1980-85 to 7.11 in 1988-92 and 7.37 in 1993-96.[89] Third, countries seen

Figure 7.4a Partial effects of democracy on corruption

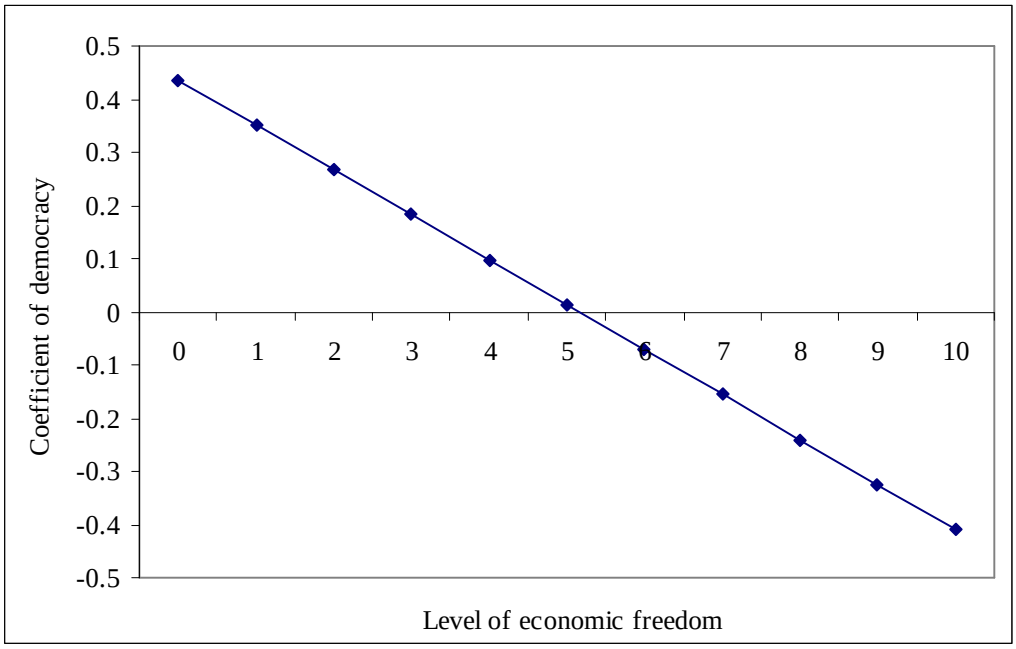
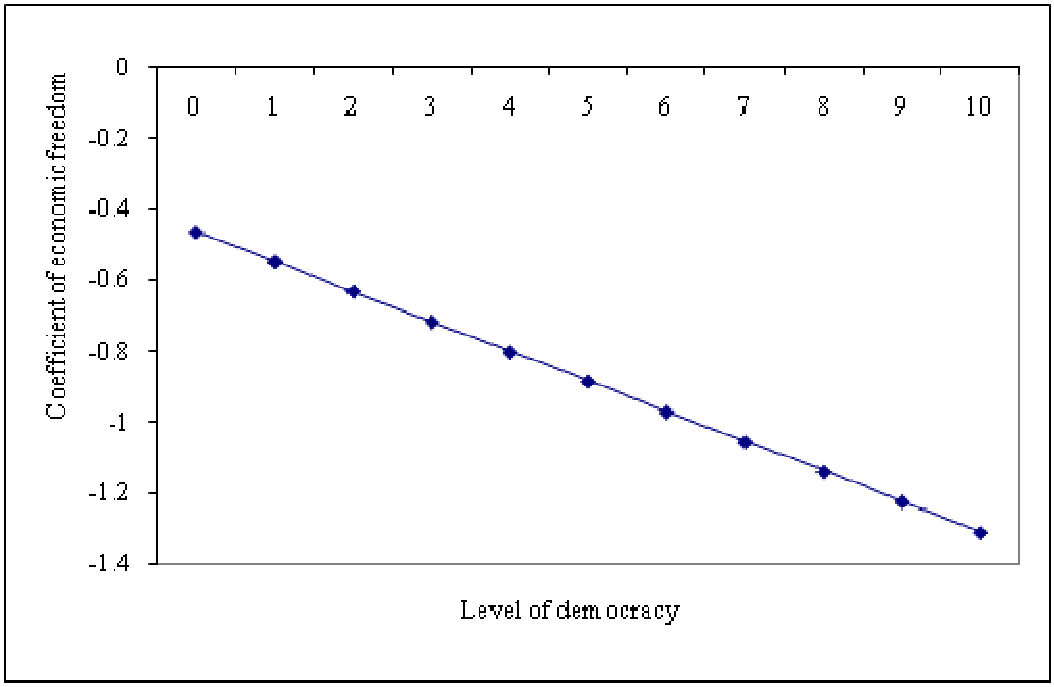


Figure 7.4b Partial effects of economic freedom on corruption



[89] See CPI from Transparency International, Historical data, 1995 Report for details. A higher value of CPI indicates the high level of corruption.

as the least corrupt are those known to be highly democratic and enjoying high levels of economic freedom, e.g. Canada, Denmark, New Zealand and other developed nations. Finally, the existence of a high level of economic freedom reduces corruption significantly even in the absence of democracy. Thus, the presence of a very high level of economic freedom in Hong Kong and Singapore makes it achievable to keep corruption at low levels even in the absence of democratic freedom.

7.6 Conclusion

This chapter presents a theoretical and empirical analysis of why corruption is low in the absence of democratic freedom in some countries or high even after achieving a high level of democracy in others. The analysis in this chapter finds that democracy and economic freedom have some opposite effects at the low level of political and economic liberalisation. In other words, in the absence of economic freedom democracy increases corruption, whereas, if economic freedom already exists in a country democratisation helps in combating corruption. However, both democracy and economic freedom have a substantial and significant impact on controlling corruption at the higher levels of political and democratic freedom. The results remain robust under various alternative panel estimations.

The partial effects results show that democracy increases corruption when the level of economic freedom is very low. However, once past a threshold level, corruption is considerably lower in a full mature democracy. Overall, the results show that economic freedom accelerates the process of combating corruption in the presence of democracy. Hence, it is concluded that an anticorruption policy of purely encouraging democratic freedoms, without encouraging economic freedoms, may be ineffective. The results are vital given the findings, which emphasise the importance of economic freedom and thus it is consistent as seen in the case of Singapore which enjoys not only the highest levels of economic freedom but also a low level of corruption even in a low level democratic environment.

APPENDIX 7

Appendix 7 consists of one table. Table A7.1 that presents descriptive statistics of the variables used in the estimation of the models.

Appendix Table A7.1 Descriptive statistics of the variables

	Mean	Median	Maximum	Minimum	Standard Deviation	Observations
EF	5.173	5.13	10	0.725	2.0791	1000
DEMO2	3.520	2.133	9.500	1.00E-06	3.372	982
CPI	5.553	6.3	10	0	2.6693	1000
GINI	38.557	37.55	63.7	20	8.9703	1000
ALR	87.812	95.74	100	33.59	16.311	1000
RGDP	9102.44	6463	36341	204	7702.2	1000
UNEM	12.254	9.25	42	0.4	9.8467	1000

Note: EF is economic freedom index, DEMO2 includes political rights, civil liberties and press freedom, CPI is corruption perception index, GINI is gini index for income inequality, ALR is adult literacy rate, RGDP is real gross domestic product per capita, UNEM is unemployment rate.

CHAPTER 8

Conclusion and Further Research

8.1 Introduction

There is a growing worldwide concern over corruption in recent years. This is because corruption has become more and more apparent in affecting the economic performance, particularly in developing countries. Most of the studies on corruption focus on its consequences and highlight the harmful effects on growth. However, to a great extent, there is a perceived lack of evidence as to the causes of corruption and why some countries are more corrupt than others. In addition, empirical research is much rare due to the difficulties of measuring relative corruption across countries. The purpose of this research has been to investigate the various causes of corruption and, more importantly, to highlight the role economic development, democracy and economic freedom can play in combating it across countries.

The thesis first examines the reliability of using the Transparency International's corruption perception index as a quantitative measure. Second, this study examines the variations in corruption across regions and by income classification of high-income, middle-income and low-income countries. Third, it develops a theoretical model to explain the role of democracy in combating corruption. Fourth, the democracy-corruption relationship has been tested empirically. In the final step, the study theoretically and empirically examines the interactions between democracy and economic freedom in reducing corruption. Various hypotheses have been developed to examine whether and to what extent economic development, democracy and economic freedom can explain the observed variations in corruption across countries. A summary of the contributions of the effects of economic development, democracy and economic freedom on corruption, and the implications for policy makers is provided in the next section. Some suggestions for further research in this area are discussed in section 8.3.

8.2 Conclusion and Policy Implications

The main findings of the thesis and contribution are outlined below, under the headings that are consistent with the objectives of the study as laid down in Chapter 1. The policy implications that arise from these findings are also discussed in sub-section 8.2.2.

8.2.1 Conclusion

A) The reliability of the corruption perception index

In examining the variability and convergence towards general agreement of the corruption perceptions index for the period 1995 to 2006, the study finds, that over time, the disparity between the different perceptions about various incidents of corruption in a country decreases. The declining trend of the standard deviation of corruption perceptions index supports the idea of convergence towards a general consensus about perceptions of corruption. The general agreement reflects a greater predictability about the level of corruption that reduces risk and uncertainty and favours policy recommendations relating to economic variables and/or doing business in a country. This finding increases the reliability and scope of using the perceptions-based index as a credible quantitative measure of corruption.

Contribution:

1. This chapter provides a deeper analysis of the corruption perception index to justify the reliability of using the perceptions-based subjective indices in the empirical investigations. It can be argued that less variation in the perception of corruption increases the predictability of the level of corruption and, in turn, increases the scope for using perception-based indices in the literature.

B) The role of economic development in combating corruption

The various hypotheses examined in studying whether economic development reduces a country's level of corruption shows the result that confirms that real GDP per capita, education, unemployment, income inequality, economic freedom and democracy are among the factors that determine the cross-country differences. The evidence suggests that high levels of real GDP per capita, education and economic freedom reduce the

level of corruption. In contrast, the degree of democracy, income inequality and unemployment increases the level of corruption in a country.

In regional perspective terms of the level of corruption it seems that higher levels of corruption are in Asia, East Europe and Latin America compared to that of Africa. Based on the income classification group of nations the results depict a strong correlation between economic development and perceived corruption. The high-income countries are less corrupt compared to low-income countries while the middle-income countries are perceived to be more corrupt than the low-income countries. Furthermore, African countries are less corrupt than high-income and middle-income countries. These results provide evidence against the claim that higher level of economic growth lowers corruption. Also the results support the possibility of the existence of a non-linear relationship between real GDP per capita and corruption. The non-linear estimation result indicates that a small increase in income at a low level of economic development is not sufficient to reduce corruption; instead it increases opportunities for more corruption. And therefore a substantially higher level of income reduces corruption in developed countries. The results suggest that the process of economic development can eradicate corruption slowly.

Contribution:

1. First, it analyses which economic and political factors are the root causes of corruption. For a comparative analysis of corruption, in addition to real gross domestic product (GDP) per capita various socio-economic variables are identified, such as tertiary education, income inequality, unemployment, type of state and economic freedom. The variations in corruption are also examined across regions in order to explain whether corruption is endemic to particular regions or countries.

2. The relationship between economic development and corruption is investigated by categorising countries into low-income, middle-income and high-income groups, in line with the international categorisation of country groupings.

3. It scrutinises the level of per capita income and the corruption relationship in a non-linear functional form for various groups of countries based on income classification.

C) The role of democracy in controlling corruption

In describing the role of democracy, the study examines the importance of well functioning institutions for deterring corruption. The theoretical results confirm the crucial role of well-functioning institutions in combating corruption. A sound democratic institution along with an independent judiciary, an independent media and active participation of the people increases the probability of detection and punishment of corrupt activity. The empirical evidence confirms the theoretical expectation and reveals that a prolonged process of democratisation eventually reduces corruption, even though there is a rise in corruption during the early stages. The empirical results confirm the hypothesis that an 'electoral democracy' represented by 'political rights' does not produce sufficient checks against corruption. Only an advanced mature democracy can restrain the corruption level significantly. Hence, a non-linear relationship arises in the relationship between democracy and corruption.

Contribution:

1. The study presents a theoretical analysis as to why a mere transition toward democracy is insufficient to reduce corruption, but an advanced democratic political system is found to be more effective in restraining corruption.

2. The study captures the comparative analysis based on aggregate measures of democracy, as well as its individual components (such as political rights, civil liberties, and press freedom), separately to find out what aspect of democracy contributes more in controlling corruption.

3. It further develops the idea of "narrow-democracy" and "broad-democracy" to analyse the relationship between democracy and corruption.

4. It examines the non-linearities between democracy-corruption in a non-linear functional form for various components of democratic indicators.

D) The joint effect of democracy and economic freedom in controlling corruption

The interactions effect between democracy and economic freedom suggest that the former can be a cure for corruption, but only in the right environment. Democracy increases corruption when economic freedom is almost non-existent, however, it reduces corruption significantly when economic freedom is above the average level. In contrast, economic freedom alleviates corruption in any political environment, and it becomes more effective when the level of democracy increases. The result indicates the crucial role economic freedom can play in curbing corruption. The result explains why the corruption level is low in Singapore and Hong Kong, for example, even though people in these countries enjoy a low level of democratic freedom.

Contribution:

1. There is no cross-country study which captures the interaction effect of democracy and economic freedom on corruption. The study examines the impact of economic freedom and the interaction between democracy and economic freedom in controlling corruption in a theoretical and empirical framework. The partial estimation analysis tests whether democracy or economic freedom is more crucial for combating corruption. In particular, does greater economic freedom or greater political freedom yield a more 'corruption free' society?

8.2.2 Policy Implications

The findings in Chapter 4 suggest that economic development is crucial for controlling corruption. The negative relationship between real GDP per capita and corruption perception index indicates that the high-income countries that enjoyed substantial growth rate have been able to control corruption significantly. A high level of educational attainment, a high level of employment and equal distribution of income discourage corrupt activities. Thus, combating corruption is achievable through economic development and that economic development is enhanced with good economic policies, especially the promotion of education, creation of new employment and the encouragement of equal distribution of income which in turn

can reduce corruption and lower the effects of corruption on the society, economy and development.

Although certain levels of corruption exist in all countries, however it is more widespread in developing countries. Developing countries are usually characterised by highly regulated economies that give rise to a high level of monopoly rents. Accountability in these countries is generally weak. Political competition, civil liberties and press freedom are often restricted. The executive branches of the government and legal institutions are weakly structured to address the complex issue of corruption in many developing countries. The findings in Chapter 5 suggest that well functioning institutions are vital for deterring corruption. Good policies are unlikely to be chosen or to be carried out effectively without honest and effective institutions. Hence a serious effort in the development of democratic institutions can reduce opportunities for corruption in the developing countries. The findings in Chapter 6 indicate that political rights, civil liberties and a responsible press are considered vital to create greater public awareness and to provide the momentum for undertaking reforms to overcome corruption. As lack of democratic indicators lead to increased corruption strengthening press freedom along with political rights and civil liberties are thus important factors in the fight against corruption.

Throughout the study, it shows that a higher degree of economic freedom reduces corruption significantly. The joint effect of democracy and economic freedom in controlling corruption (Chapter 7) illustrates that greater economic freedom seems to be a more effective deterrent to corrupt activities. The finding suggests that efforts are needed to reform the markets in the developing countries and a policy towards economic liberalisation in these countries can help in reducing corruption significantly.

In summary, the findings of the thesis suggest that developed countries have succeeded in controlling corruption through higher levels of economic development along with economic and political freedom. Moreover, evidence is found that higher education has a lowering effect on the perceived corruption in a country. Policy

makers should provide considerable efforts directed at the establishment of good education along with decentralisation of economic and political power.

8.3 Further Research

It is important to recall that this study has emphasised the level of corruption in the public sector. However there exists corruption in the private sector too. Like public sector officials, high ranking corrupt officials in the private sector could misuse their power for private gains. The studies on corruption are mostly of public sector corruption and do not distinguished between the public and private sectors. The conventional wisdom is that public sector corruption is much more harmful, but we are not aware of any formal analysis of the private sector corruption. Therefore, it would be of interest to investigate the causes and consequences of private sector corruption.

In examining the causes of corruption the study finds that higher unemployment increases corruption, particularly in developing countries. In this situation, it is important to examine the role of social security benefits and whether such benefits assist in reducing corruption in the developed countries. Also, in examining the relationship between democracy and corruption, the study confirms the existence of a non-linear relationship between democracy and corruption. While the study has investigated the non-linear relationship in a cross-sectional framework, it is interesting to see whether a non-linearity relationship exists in the country-specific cases.

Examination of the effect of each component of democracy and the combined democracy indices show which components of democracy are crucial in deterring corruption. Along with democracy, the effect of economic freedom on corruption has been examined. The economic freedom index is as composite index based on eight individual freedom variables, so further research could be useful to examine the individual component and its impact on corruption. These separate components of economic freedom could be vital in focusing which components are more effective in reducing corruption. In addition, although economic freedom index captures the

black market activity to some extent, however, further research will incorporate the black market premium variable to assess the effect of black market on corruption.

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