DECENTRALISATION, CORRUPTION, AND ECONOMIC GROWTH:
A MACROECONOMIC PERSPECTIVE

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This thesis represents a contribution to the literature on the relationship between decentralisation, corruption, and economic growth. This relationship is analysed both theoretically and empirically.

The first chapter investigates one of the channels through which decentralisation can potentially affect corruption and economic growth. The analysis uses a dynamic general equilibrium model to gain further insights into the effects of decentralisation on the structure of corruption. The results suggest that decentralisation, by bringing the people closer to government, can enable corrupt local government officials to internalise the effects of their behaviour. It thereby generates an incentive for officials to moderate their bribe demands. This has positive effects for investment and economic growth.

The second chapter examines a potential trade-off that may occur when countries embark on a program of decentralisation. On the one hand decentralisation may improve the information problems that plague overly centralised governments, but at the same time it can potentially lead to a loss of control as discretionay power is granted to local officials without implementing the required accountability mechanisms. The results of the analysis suggest that while decentralisation can potentially reduce corruption an aid economic performance in the long run, it may inevitable lead to increased corruption in the short-run. A key idea is that extra care must be taken to introducing accountability structures at the local level, but that these will likely take time before becoming effective, so that in the near term corruption may increase.

In the third chapter the relationship between decentralisation, corruption and economic growth is analysed empirically, using panel data techniques. While previous studies have looked at the relationship between decentralisation and corruption, or between decentralisation and growth, or between corruption and growth, few have looked at the joint relationship between the three. Moreover,
previous studies often suffer from endogeneity problems. To overcome this, the Generalised Method of Moments technique is employed; an approach that has not been used on this topic before. It is shown that, while there is evidence that corruption hampers economic growth, the effects of decentralisation are ambiguous. The chapter highlights the inherent difficulties in analysing the effects of decentralisation, which is a complex and multifaceted concept that is impossible to fully capture in the data. This suggests that empirical studies will inevitably be limited in their ability to fully assess a relationship as nuanced as this. The implication is that further investigation at the theoretical level is required.

Overall, the thesis provides support for the idea that decentralisation can potentially lead to beneficial outcomes, both in terms of combating corruption and in wider economic terms. However, it also suggests that care must be taken when implementing reforms as these beneficial outcomes are far from certain.

**DECLARATION**

No portion of the work referred to in the thesis has been submitted in support of an application to another degree of qualification of this or any other university or other institute of learning.

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INTRODUCTION

While weak governance and corruption are hardly unique to developing countries, their impact on poverty and growth is particularly devastating. Poor people around the world lack access to adequate health care, education, or other essential services because their public systems are inefficient, unresponsive, and fundamentally malfunctioning. Resources that should be used to fuel economic growth and create opportunities for the poor instead go to enrich corrupt elites. Aid funds face the same risks. In some cases, poor governance and entrenched corruption have contributed to economic collapse, with disastrous consequences for the poor. Thus, improving governance and reducing corruption are crucial for helping poor people to escape poverty (World Bank 2007).

While some countries have shown improvements in governance and anticorruption, others have deteriorated. In order to make greater progress, there is a need to build on lessons learned. Good governance requires transparent and accountable institutions, combined with adequate capacity and competence (World Bank 2007). One of the most widely proposed policies aimed at improving governance, is the decentralisation of government. Decentralisation has become a popular reform for many developing countries and is now one of the main focuses of development agencies such as the World Bank (Shah 2012). Yet in many cases the results of decentralisation have been disappointing and the relationship between decentralisation and corruption remains unclear (World Bank 2008b). An increasing concern for many is that, rather than actually reducing corruption, decentralisation may merely shift it to lower levels of government (Bardhan and Mookherjee 2006). The evidence suggests the relationship between decentralisation and corruption is complex. As such it is important to consider in what circumstances decentralisation will help to reduce corruption and

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1 Governance and corruption are not synonymous. Governance refers to the manner in which public officials and institutions acquire and exercise the authority to shape public policy and provide public goods and services. Corruption is one outcome of poor governance, involving the abuse of public office for private gain. Public office is abused when an official accepts, solicits, or extorts a bribe and when private agents give or offer bribes to circumvent public policies and processes for competitive advantage and profit. It is also abused through patronage and nepotism, the theft of state assets, or the diversion of state revenues (World Bank 2007).
improve economic outcomes and in what situations decentralisation may make matters worse.

This thesis analyses the relationship between decentralisation, corruption and economic growth both theoretically and empirically. The theoretical analysis uses formal macroeconomic modelling. The empirical investigation uses advanced panel data techniques.

The focus of much of the theoretical research on governance and corruption has tended to be from the microeconomic perspective, using a partial equilibrium approach. Rather less research has been focused on the macroeconomics of misgovernance within the context of dynamic general equilibrium models. The first chapter of this thesis aims to investigate further the relationship between corruption, decentralisation and economic growth from a macroeconomic perspective. This is done using a dynamic general equilibrium model in which it is shown that, by bringing the government closer to the people, decentralisation can create an environment in which bureaucrats are able to recognise the effects of their corrupt behaviour on the agents they have dealings with. This generates an incentive for bureaucrats to reduce the bribes they charge to entrepreneurs and so creates a more favourable investment climate. The overall result is that decentralisation can help reduce corruption, increase investment and foster economic growth. This result is somewhat different from the conclusions of much of the literature, where it is often assumed that decentralisation leads to a more disorganised form of corruption, thereby worsening economic outcomes.

Chapter two presents a model which captures two important features of decentralisation. One of the main proposed benefits of decentralisation is that it may improve the information problems that plague overly-centralised governments. However, decentralisation involves granting discretionary power to local governments who may not be as accountable for their actions. This can create new opportunities for corruption at the local level. As such, a trade-off emerges, meaning that decentralisation has the potential to either increase or decrease the level of corruption, and to either impede or foster economic performance. A main objective of the model is
to identify conditions under which these different outcomes may arise. The model highlights how important it is for policy makers to introduce new accountability mechanisms at the local level when implementing reforms. However, it is also argued that it may take time for these new structures to be effective. As such it is likely that decentralisation can lead to an increase in corruption in the short run. Over the long run, as the new accountability mechanisms gradually come into effect, decentralisation should indeed improve outcomes.

In the third chapter, the relationship between decentralisation, corruption, and economic growth is investigated empirically, using panel data techniques. This is done in an attempt to identify an overall relationship between the three. The chapter makes use the Generalised Method of Moments approach in order to overcome the endogeneity problems that many studies of this kind suffer from. It is shown that, while there does indeed appear to be a negative relationship between corruption and economic growth, the effects of decentralisation are ambiguous. The chapter highlights a fundamental problem of analysing the effects of decentralisation from a macroeconomic perspective; namely, that the data is extremely limited. It is impossible to fully capture a complex and multifaceted issue such as decentralisation in a reliable way using existing data sets.

Overall, the thesis contributes to the literature on the relationship between corruption, decentralisation and economic performance; with chapters one and two analysing this issue from a theoretical perspective, and chapter three using empirical techniques. By identifying some of the avenues through which this relationship operates theoretically and by highlighting the inherent difficulties in analysing this issue empirically, the complex nature of this relationship is highlighted. The analysis suggests that decentralisation can be an effective way to reduce corruption and improve economic outcomes, but that this is by no means a certain outcome.

The rest of the thesis is divided into the three chapters summarised above, followed by some conclusions presented in the last section. Appendices containing data descriptions, results tables, and technical notes are presented at the end of each chapter.
CHAPTER 1: DECONCENTRATION, CORRUPTION AND ECONOMIC GROWTH

1. Introduction

The problem of poor governance and corruption remains one of the main obstacles to economic development (Shah 2012). Decentralisation is widely seen as a means to improve governance and is viewed as a central part of the fight against corruption (Bardhan 2002; Crook and Manor 1998; Fukasaku and de Mello 1999; Manor 1997; Shah 2000). However, the relationship between corruption, decentralisation and economic development is unclear (Bardhan and Mookherjee 2005; Bruess and Eller 2004; Fjeldstad 2004). This is perhaps not surprising given that both decentralisation and corruption are complex, multi-faceted issues in themselves.

There appears to be numerous avenues through which decentralisation can potentially affect the level of corruption. Some of these may indeed reduce corruption. For instance, by moving decision making ‘closer to the people’, the potential benefits of decentralisation include improved information and greater accountability (Seabright 1996). Decentralisation can also increase competition into government (Gurgur and Shah 2005). These traits are viewed to be vital in fighting corruption (Ades and Di Tella 1999; Aidt 2003; Jain 2001; Tanzi 1998).

However, only if implemented in the right way will these benefits arise. It has been pointed out that, by increasing the discretionary power of local bureaucrats, many of whom may lack effective oversight, decentralisation can increase opportunities for corruption (Prud’homme 1995). It is also augured that decentralisation may lead to local capture by powerful elites (Bardhan and Mookherjee 2000). Decentralisation may also increase the incidence of corruption by raising the number of officials involved in decision making (Shleifer and Vishny 1993).

A commitment to decentralisation has become an important element of donor supported anti-corruption strategies (World Bank 1997; 1999).
In order to determine whether decentralisation can be an effective institutional reform in terms of reducing corruption and aiding economic development it is necessary to analyse which of these effects dominate, and in what situation. Answering this has not proven to be straightforward. For this reason continuing research in this issue is of paramount importance.

The focus of much of the theoretical research on governance and corruption has tended to be from the microeconomic perspective, using a partial equilibrium approach. Rather less research has been focused on the macroeconomics of misgovernance within the context of dynamic general equilibrium models. This chapter aims to investigate further the relationship between corruption, decentralisation and economic growth from a macroeconomic perspective. This is done using a dynamic general equilibrium model in which it is shown that, by bringing the government closer to the people, decentralisation can create an environment in which bureaucrats are able to recognise the effects of their corrupt behaviour on the agents they have dealings with. This induces bureaucrats to reduce the bribes they charge to entrepreneurs and so creates a more favourable investment climate. The overall result is that decentralisation can help reduce corruption, increase investment and foster economic growth.

The following section highlights the literature on this topic. Section three introduces the macroeconomic model to be used in the analysis. Section four analyses corruption under alternative bureaucratic structures while section five concludes.

2. Literature Review

2.1 Corruption

The relationship between public sector corruption and economic growth has been the subject of considerable research, leading to a broad consensus that corruption is a major obstacle to economic development. In particular, since the 1990's a significant body of empirical evidence has emerged pointing towards a negative effect of corruption on economic activity (e.g., Gyimah-Brempong 2003; Keefer and Knack

This empirical research, together with numerous theoretical studies, highlights the many channels through which corruption might impede economic performance. For instance: corruption may cause a misallocation of public expenditures away from vital areas, such as health and education, towards less productive areas such as military spending, which are targeted more for their capacity to generate bribes than their potential to improve living standards (e.g., Gupta et al. 2001; Mauro 1998; Tanzi and Davoodi 1997); corruption may cause a misallocation of talent away from productive activities such as entrepreneurship towards non-productive activities such as rent-seeking (e.g., Acemoglu 1995; Ehrlich and Lui 1999; Murphy et al. 1991); corruption may undermine the protection of property rights, create obstacles to doing business, impede innovation and technological transfer, causing firms to expand less rapidly and employ inefficient technologies, often in the informal sector (e.g., Hall and Jones 1999; North 1990; Sarte 2000; Svensson 2005); corruption may limit the extent of a country's trade openness and reduce inflows of foreign investment (e.g., Pellegrini and Gerlagh 2004; Wei 2000); corruption creates inherent costs in concealment and detection activities which are a deadweight loss to society (e.g., Blackburn et al. 2006; Blackburn and Forgues-Puccio 2007); corruption can impede human development through its negative impact on public health and education programmes (e.g., Azfar 2001; Blackburn and Sarmah 2008; Gupta et al. 2000; Reinikka and Svensson 2005); and corruption may cause governments to rely on seinorage to finance their expenditures which increases inflation and induces detrimental portfolio reallocations by the private sector (Blackburn et al. 2008).

In addition to all this, there is good reason for believing that the relationship between corruption and growth is two-way causal (e.g., Blackburn et al. 2006; Blackburn and Forgues-Puccio 2007; Blackburn and Sarmah 2008; Montinola and Jackman 1999; Treisman 2000).

Research on corruption has led to a whole range of strategies that aim to reduce the incidence and effects of corruption (Huther and Shah 2000). Such strategies are
generally targeted at influencing the incentives and opportunities of economic agents, particularly government officials. However, there has been relatively little success in fighting corruption in recent times. In the last 40 years only Hong Kong, Singapore and perhaps a few others have made significant progress in reducing corruption (Tanzi 1998). While the success of these countries can provide valuable lessons, their strategies are not easily replicated in larger countries, especially countries with lower per capita income and associated governance problems.

2.2 Decentralisation

It is now clear that the problem of poor economic performance in developing countries requires a long term strategy of improving governance. Achieving this is not an easy task. Among the many policy recommendations put forward, decentralisation is one of the most widely supported (Bardhan 2002). Decentralisation involves the shifting of fiscal, political and administrative responsibilities from higher to lower levels of government. However, the details of reforms differ from country to country. The literature often refers to three types of decentralisation: deconcentration, delegation and devolution (Martinez-Vazquez and McNab 1998). Deconcentration is a process followed by central governments to increase effectiveness and flexibility through regional or local offices of the central government. Delegation is a top-down process where the centre retains significant power while the subnational units have limited discretion and are still accountable to the central government. Devolution is a bottom up process in which the subnational units have more independence.

For each type of decentralisation, there is also a wide range of governmental functions that may or may not be decentralised. For instance, fiscal decentralisation involves the transfer of at least some decision making power for revenue generation and/or expenditure to lower levels of government. This can include the setting and collecting taxes, borrowing from higher government or markets and allocating expenditures on local services. Administrative decentralisation includes legislative powers such as the authority to design and implement certain laws, regulations, grant licenses and permits. Political decentralisation focuses on whether the local government is elected by local residents or appointed by higher government.
Thus, decentralisation reforms can vary considerably from country to country. For example, in China we see delegation of economic responsibilities and legislative powers, but not political. In other countries such as India we have the opposite (Bardhan and Mookherjee 2005).

2.3 Decentralisation and Corruption

Following Tiebout’s seminal paper (1956), a literature developed emphasising the benefits of decentralisation through the competition among subnational governments that it makes possible (see Rubinfeld 1987). In this view competition for mobile residents should match bundles of public goods to residents demands more accurately (Oates 1972).

However, many of the assumptions from which the traditional theories rely may not hold, especially in developing countries. In particular, factors such as labour and capital may not be sufficiently mobile and the democratic institutions may not be sufficiently developed (Oates 2008). Also, it seems that developing countries often implement less extensive forms of decentralisation than high income countries (Oates 1972; 1985). Shah (2012) notes that, in many countries, local authorities continue to lack real autonomy from central control and have yet to acquire clearly defined rights and duties, while elected local authorities are yet to be established. Thus from the perspective of traditional theories, it may be natural to be sceptical about the benefits of decentralisation (Martinez-Vazquez and McNab 1998).

However, the ability, competence and or skill level of local officials or bureaucrats in developing countries may be insufficient to carry out complex government functions, and so more extensive forms of decentralisation may be inappropriate (Prud'homme 1995). Moreover, introducing quite limited forms of decentralisation may be an important step in developing more democratic institutions which in turn may enable

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3 Most notably, if corruption increases under decentralisation, the supposed advantages may be jeopardised. Brueckner (2000) adapts Tiebout’s model to include corruption. The analysis shows that this does indeed limit the benefits from decentralisation.
more extensive decentralisation to be implemented at a later stage. A gradual process such as this has been recommended by the UN (2000) in countries where previous decentralisation reforms have failed. Indeed, there are many concerns stemming from specific situations, particularly in the transition countries, in which the decentralization process has been undertaken too rapidly (World Bank 2006a). Martinez-Vazquez and McNab (1998) suggest an important point could be to find the minimum conditions necessary for decentralisation to have a positive effect.

Recently a ‘second generation’ literature has developed focusing in how decentralisation affects accountability and incentives of government agents (Bardhan and Mookherjee 2005; Oates 2005; Weingast 2009). In this new literature the relationship between corruption and decentralisation is a central issue. However the effect of decentralisation on corruption within developing countries remains unclear. As Bennet and Estrin (2006) point out, results often depend on what form of decentralisation is being examined and which government functions are being decentralised.

2.3.1 Empirical Evidence

Decentralisation and Corruption

Empirical studies on this issue are difficult because the effect of decentralisation on corruption appears to be context specific. This makes any general relationships hard to detect. However, several authors have attempted to analyse the relationship between decentralisation and corruption using cross national empirical studies. Perhaps not surprisingly, the results of these studies are mixed. However, the majority of studies suggest that decentralisation reduces corruption (Huther and Shah 1998; de Mello and Barenstein 2001; Fisman and Gatti 2002; Arikan 2004; Lederman et al. 2005; Dreher 2006; Kyria and Roca-Sagale’s 2011; Altunbas and Thornton 2012).

4 They examine unconditional correlations between decentralisation and quality of governance. It is well known that richer countries are generally more decentralised and that richer countries are also better governed, so that the unconditional correlation will be biased.

5 The authors attempted to overcome the endogeneity problem by using legal origin as an instrumental variable. Bardhan and Mookherjee (2005) cast doubts on the validity of this instrument.
Other studies suggest that decentralisation can be an effective tool for fighting corruption, but only under certain circumstances. For instance: Enikolopov and Zhuravskaya (2007) report that governance indicators improve only when fiscal decentralisation is combined with strong national parties; Nupia (2007), using the same data set as Fisman and Gatti (2002), argue that the effect of decentralisation on corruption cannot be confirmed in developing economies; Lessmann and Markwardt (2010) found that decentralisation reduces corruption where there is press freedom, but otherwise increases corruption.

Other studies find that decentralisation (or federalism) increases corruption: Fan et al. (2009), using a cross section data of 80 countries, found that reported bribery was more frequent in countries with a large number of tiers; Freille et al. (2008) find that fiscal decentralisation is associated with lower corruption but federalism is associated with higher corruption; Goldsmith (1999), Treisman (2000) and Kunicová and Rose-Ackerman (2005) all found that federal structure was associated with higher perceived corruption.

One important issue when undertaking empirical studies of this kind is that the measurement of decentralisation is rather subjective. For instance the literature above describes three types of decentralisation (deconcentration, delegation and devolution) as well as three dimensions along which government functions can be decentralised (fiscal, political and administrative). Due to data limitations it is generally the case that empirical studies are forced to focus on fiscal decentralisation (with issues surrounding the form of decentralisation being ignored). Furthermore, even within the realm of fiscal decentralisation, there are various measurements than can be employed (subnational share of total government expenditures, subnational share of total government revenues) as well as the more fundamental problem of attempting to capture the genuine autonomy that subnational governments have over decision to spend and tax. Finally, Treisman (2007) finds that any relationship between corruption and fiscal decentralisation is highly sensitive to the control variables included, casting doubts on empirical studies.

Decentralisation and Growth
Other studies have attempted to identify a direct effect of decentralisation on economic growth. It is often proposed in theory that the decentralisation of power to lower level governments leads to improved economic efficiency and an increase in the growth rate at the national level (Iimi 2005). However, the existing empirical evidence points to a mixed picture of the effect of decentralization on economic growth.

Philipps and Woller (1998) find a weak inverse relationship between decentralisation and growth for developed countries and find no significant relationship for developing countries. Conversely, Davoodi and Zou (1998) found that there is a negative relationship between decentralisation and growth for developing countries, while there is no significant relationship for developed countries.

Thieben (2003) finds that there exists a "hump-shaped" relationship between economic growth and fiscal decentralisation. Countries with medium decentralisation have a slightly higher growth than countries with a high or a low degree of decentralisation. Martinez-Vazquez and McNab (2003) do not detect a direct relationship between fiscal decentralization and economic growth, although they are able to establish an indirect relationship through price stability. Iimi (2005) finds that fiscal decentralization has a significant positive impact on per capita GDP growth. Thornton (2007) measures decentralisation only by those own revenues upon which sub-national governments have full discretion. Using this measure it is found that decentralization does not affect economic growth.

Overall, the empirical relationship between decentralisation and economic growth is also ambiguous, with studies presenting contradictory results.

2.3.2 Theoretical Analysis

To fully understand the effects of decentralisation on corruption and economic performance it is necessary to think about the various avenues through which the transfer of decision-making power can influence the accountability and incentives of government agents.
Competitive Pressures

One of the main avenues through which decentralisation is argued to help reduce corruption is through the competition among regional or local governments that it makes possible (Brennan and Buchanan 1980; Edwards and Keen 1996; Montinola et al. 1995). The need to attract labour and capital is thought to induce local officials to be more honest and efficient. Arikan (2004) analyses the effect of decentralisation in terms of an increase in the number of compositing jurisdictions. It is shown that an increase in horizontal competition does indeed lower corruption.

It is also possible that competition for mobile factors may have less favourable outcomes, especially when we allow for the possibility of heterogeneous regions. Cai and Treisman 2005) suggest that more backward regions, recognising they are unable to attract capital using business friendly policies, will instead resort to predation. Alternatively, Cai and Treisman (2004) argue that corrupt regional governments may attempt to attract business by promising to protect them from central government policies such as taxes or regulations. This in turn could reduce the capacity of the central government to govern effectively and thereby increasing corruption further.

It should also be noted that the assumptions upon which these theories rely, such as mobile factors of production, may not be appropriate in many developing countries (Litvack et al. 1998; Oates 2008). Vertical competition is an important complement to horizontal competition because it does not rely on the movement of factors between regions. Vertical competition occurs when governments from different levels compete with one another. Breton (1996) argues that the competition between different levels of government brought about by decentralisation will lower corruption.

Discretionary Power

Prud'homme (1995) points out that decentralisation may create new opportunities for corruption at lower levels of government without necessarily putting new checks in place. Similarly, Persson et al. (1997) note that since subnational governments are less powerful and prestigious, monitoring may be less intense. Arikan (2004) suggests smaller jurisdictions may mean more detailed regulation of economic activity, increasing the opportunities for corruption. This view is supported by Persson et al.
(2003) who find empirical evidence that smaller voting districts lead to more corruption.

Alternatively, others have argued that, while decentralisation can protect against corrupt government by creating further checks and balances, it can also prevent the government from carrying out its functions effectively. Tsebelis (1995, 1999) argues that institutional reforms such as decentralisation that multiply the number of veto players will tend to lock-in the status quo, whether good or bad. In such situations, corrupt side practices may become more likely.

Local Capture
Bardhan and Mookherjee (2000) put forward several reasons why local government may be inherently more prone to capture. Firstly, at lower levels of government the intimacy and frequency of interaction between officials and private agents is greater which can lead to the development of cosy relationships with local elites. Furthermore, at the local level interest groups may be more cohesive, the press may be less professional or easily bought, while elections and other issues may get less coverage. All of these suggest decentralisation may leave local elites with greater power and discretion to choose policies and allocate resources in ways that favour their own network of clients, friends and family, thereby increasing favouritism, prejudice and nepotism. Blanchard and Shleifer (2000) and Sonin (2003) present models suggesting strong administrative control by the central government is essential to avoid this problem. Enikolopov and Zhuravskaya (2007) provide empirical support that a strong centre is vital for decentralisation to be effective in reducing corruption.

Accountability
One of the most important issues surrounding decentralisation centres on whether, and in what circumstances, accountability is increased. It is commonly suggested that by ‘bringing the government closer to the people’ decentralisation might increase accountability (Fjeldstad 2004).

Seabright (1996) shows how decentralisation can be a means to increase democratic accountability. This occurs because government agents in a decentralised system are
more directly accountable for their actions since they are only responsible for specific
tasks in specific regions. Thus, voters in any particular region are better able to
reward or punish the government, by voting them in or out, based on their view of the
government’s performance. However, Fisman and Gatti (2002) point out that the
dividing of responsibilities in a decentralised system can weaken accountability if
voters are left with less information about which layer of government is responsible for
failures and success.

Another route through which decentralisation can reduce corruption via democratic
pressures (combined with competitive pressures) is through ‘yardstick competition’
(Besley and Case 2006; Salmon 1987). Here the idea is that decentralisation enables
voters to compare the performance of their region with nearby regions. If excessive
corruption leads to relatively poor performance, the electorate can take action.

Once again it should be noted that the key assumption upon which these models are
built, namely that governments at all levels to be subject to electoral accountability,
does not appear appropriate for many developing countries

Decentralisation and the Rent-seeking Environment
Following a seminal paper by Shleifer and Vishny (1993), several authors have looked
at how the effects of corruption are influenced by its underlying structure (Blackburn
and Forgues-Puccio 2009; Celentani and Ganuza 2001; Ehrlich and Lui 1999; Waller
et al. 2002). In this strand of the literature, competitive (or disorganised) corruption
refers to an environment in which each agent maximises his own individual utility,
while in an environment of organised corruption a syndicate oversees the corruption
decisions of the population of agents. Organised corruption is generally seen to lead to
lower levels of corruption. This is because organised corruption can serve to curb the
negative externalities individual agents impose on each other, generating incentives to
keep the number of bribe takers down, and to stick to agreements, limiting the impact
on economic activity.

It is common in the literature to view organised and centralised as synonymous. Thus,
if decentralisation leads to greater dispersion of decision making powers, a lack of
coordination may generate incentives for agents to “overgraze” the common bribe base leading to “excess” rent extraction (Fisman and Gatti 2002; Fan et al. 2009).

However, as Ahlin (2004) points out, this argument may fail. The number of independent regulators might not increase in a decentralised system. In fact, administrative complexity at the centre and decentralisation might be substitutes; to govern directly the central government may need to create more independent agencies in the capital to take the place of local field agents. The key to decentralisation increasing corruption revolves around whether power is decentralised in such a way that creates an environment in which multiple government units are each interfering with economic activity within jurisdictions, rather than enabling each unit to gain complete control over his jurisdiction. This is an issue to which we aim to investigate further in this chapter.

In the following section we present a model that is intended to capture the elements of a fairly limited form of decentralisation - administrative deconcentration - that is representative of the types of decentralisation found in many developing countries. This allows us to focus on the effects of decentralisation on the structure of corruption, rather than issues such as interjurisdictional competition, which may not be relevant for many low income countries.

3 The Model

We consider an economy that is spatially divided into a fixed number, $N$, of separate regions or locations. Each region is inhabited by a constant population, $n$, of two-period-lived agents belonging to overlapping generations of dynastic families. Agents of each generation are divided at birth into two groups of market participants - households (or workers), of whom there is a fraction, $\epsilon \in (0,1)$, and firms (or entrepreneurs), of whom there is a fraction, $1 - \eta \in (0,1)$. The former are suppliers of labour when young and consumers of output when old. The latter are producers of capital when young, and producers and consumers of output when old.
Capital is produced from investment projects that are funded by loans under the terms and conditions of financial contracts. For certain types of project to be undertaken, licenses must be acquired from public officials (or bureaucrats), of whom there are $m$. Bureaucrats exploit their monopoly control over these licenses by issuing them only in exchange for bribes.

All agents are risk neutral and all markets are competitive. We proceed with our formal description of the environment with reference to the circumstances facing agents of generation $t$ in a particular region.

### 3.1 Individual Behaviour

The ultimate activity of entrepreneurs is the manufacture of final output in the second period of their lives. The inputs to manufacturing are labour (hired from young households of the next generation) and capital (acquired from investment projects undertaken previously by firms of the current generation). A mature entrepreneur employing $h_{t+1}$ units of labour and $k_{t+1}$ units of capital is able to produce $y_{t+1}$ units of output according to

$$y_{t+1} = \Theta h_{t+1}^\theta k_{t+1}^{1-\theta} K_{t+1}^\theta$$

(1)

($\Theta > 0$, $\theta \in (0,1)$) where $K_{t+1}$ denotes the aggregate stock of capital.\(^6\)

Labour is hired at the competitively-determined wage rate $w_{t+1}$, whilst capital is rented at the competitively-determined interest rate $r_{t+1}$. If an entrepreneur produced $\hat{k}_{t+1}$ units of capital when young, then he is a net borrower of capital if $k_{t+1} - \hat{k}_{t+1} > 0$ and a net lender of capital if $k_{t+1} - \hat{k}_{t+1} < 0$. His profit is therefore

$$\pi_{t+1} = \Theta h_{t+1}^\theta k_{t+1}^{1-\theta} K_{t+1}^\theta - w_{t+1} h_{t+1} - r_{t+1} (k_{t+1} - \hat{k}_{t+1})$$

which, for given values of $w_{t+1}$, $r_{t+1}$, $K_{t+1}$ and $h_{t+1}$, is maximised by choosing $h_{t+1}$ and $k_{t+1}$ so as to satisfy

$$\theta \Theta h_{t+1}^{\theta-1} k_{t+1}^{1-\theta} K_{t+1}^\theta = w_{t+1} \text{ and } (1-\theta) \Theta h_{t+1}^\theta k_{t+1}^{1-\theta} K_{t+1}^\theta = r_{t+1}.$$

\(^6\) This aggregate externality – a common feature of endogenous growth models – allows us to work with a simple AK technology, where the social returns to capital are constant. Our main results would not change were we to assume diminishing returns to capital.
Assuming that each household supplies one unit of labour, the total demand for labour in a region is \((1 - \eta)n h_{t+1}\). Equating this to total labour supply, \(\eta n\), gives \(h_{t+1} = \eta / (1 - \eta)\). Since \(k^\theta_{t+1} = (1 - \eta)n k_{t+1}\) in equilibrium as well, we may write the foregoing conditions as

\[
w_{t+1} = \theta \eta \left(\frac{1 - \eta}{\eta}\right)^\theta k_{t+1} = \omega k_{t+1},
\]

(2)

\[
r_{t+1} = \theta (1 - \theta) (\eta n)^\theta = r
\]

(3)

Correspondingly, \(\pi_{t+1} = r k_{t+1}\) which gives the potential payoff to each entrepreneur from engaging in productive activity.

An entrepreneur begins life with zero resources, but has the opportunity to undertake an investment project by acquiring loans from all other agents (households and bureaucrats) of the same generation. Two types of project are available: the first involves the use of some basic, rudimentary technology that is freely available and that yields \(\phi > 0\) units of capital per unit of loan with minimal (zero) effort. The second entails the operation of a more advanced technology that requires licenses from public officials and that yields \(\Phi > \phi\) units of capital per unit of loan form some positive amount of effort.

We comment further on these features below. For now, we note that the total amount of capital \(k_{t+1}\) that can be produced from each type of project with a total loan size of \(l_t\) is given by

\[
k_{t+1}(\cdot) = \begin{cases} \Phi l_t \\ \phi l_t \end{cases}
\]

(4)

The financial arrangements between lenders and borrowers are determined straightforwardly as there are no capital market imperfections in the model. Let \(l_{t+1}\) denote the rate of interest charged on loans. We assume that, in addition to these loans, households and bureaucrats are able to access a storage technology which pays
a fixed rate of return of \(i\). Given this, then competition between lenders means that \(I_{t+1} = i\) in equilibrium.

As indicated above, an entrepreneur who chooses to produce capital using the advanced technology must obtain various licenses, or permits, from public officials. The total number of licenses is denoted by \(M\) and the total number of officials is denoted by \(m\). Licenses are complimentary in the sense that all of them are required – otherwise, only the basic technology can be accessed.

In the absence of any rent-seeking, each license is issued free of charge. In the presence of rent-seeking, each license is granted only in exchange for the promise of a bribe payment once the return on a project has been realised. Specifically, bribes are demanded as a fraction of an entrepreneur’s realised payoff, \(\pi_{t+1}\), in which case the total fraction of this payoff that is extorted is given by \(B_{t+1} = mb_{t+1}\). The precise determination of bribes is an issue that we take up later when it is shown that bureaucrats’ optimal rate of extortion is constant, \(b_{t+1} = b\) (hence \(B_{t+1} = B\)) for all \(t\).

For now we note that our modelling of corruption can be likened to the case in which public officials receive kickbacks ex post in the form of a share of a company’s profits. That such arrangements exist in practice implies that, for one reason or another, firms find it worthwhile to adhere to their ex ante bribe promises. One reason for this might be the threat of being closed down or being denied licenses in the future if bureaucrats’ demands are not met; another might be the possibility that bribes are a means of avoiding costly rules and regulations, in which case bureaucrats could retaliate against renegers of promises by threatening to report them for running a business illegally, having failed to comply with official procedures. Such activities are well documented in the literature on corruption (see e.g., Rose-Ackerman 1999).

The enforcement of illicit agreements between private and public agents is an issue worth pursuing, but it is not on that we explicitly address in the present analysis. Rather our interest lies elsewhere, being focused on the question of how corruption might influence economic performance and how it may do so to the extent that depends on the structure of the bureaucracy.
As also indicated above, operation of the advanced technology requires some positive input of entrepreneurial effort, \( e_t \). We assume that this effort yields a disutility of \( \delta e_t \) and that the amount which is needed increases with the scale of the project such that \( e_t = \epsilon l_t (\epsilon > 0) \). Different amounts of effort are needed by different entrepreneurs, whom we assume to be randomly endowed with idiosyncratic technical capabilities (skills, knowledge, expertise and the like), attributes that are unimportant for operating the basic technology. These attributes are realised according to a distribution of \( \epsilon \) which accounts for agent heterogeneity in the model. For simplicity, we specify \( \epsilon \) to be uniformly distributed on the interval \([0,1]\) with probability density function \( f(\epsilon) = 1 \). Thus, \( \int_{\epsilon_0}^{\epsilon_1} f(\cdot) d\epsilon = \epsilon_1 - \epsilon_0 \) gives the fraction of entrepreneurs for whom \( \epsilon \in (\epsilon_0, \epsilon_1) \).

We are now in a position to deduce the final utility of an entrepreneur. As noted previously, the profit that each firm makes from productive activity is \( \pi_{t+1} = r \kappa_{t+1} \), where \( \kappa_{t+1} \) is determined according to (4). Irrespective of which technology is used to produce this capital, the firm faces a loan repayment of \((1 + i)l_t\). In the case of the basic technology, this is the only cost that is incurred. In the case of the advanced technology, there is also the cost of the bribe payments, \( Br\kappa_{t+1} \), together with the disutility of effort, \( \delta e l_t \). Collecting these observations together, it follows that entrepreneurial utility can be written as

\[
\begin{align*}
\nu_t &= \begin{cases} 
[r\phi - (1 + i)]l_t & \text{if } r\Phi(1-B) - (1+i) - \delta e > 0 \\
[r\Phi(1-B) - (1+i) - \delta e]l_t & \text{otherwise}
\end{cases} 
\end{align*}
\] (5)

The decision problem for an entrepreneur is to maximise his utility by choice of investment project. In accordance with (5), this entails choosing the advanced project if \( r\Phi(1-B) - \delta e > r\phi \). When holding with equality, this condition determines a critical level of effort, denoted \( \hat{\epsilon} \), which separates different types of project investor. That is,

\[
\hat{\epsilon} = \frac{r[\Phi(1-B) - \phi]}{\delta} = \mathcal{E}(B) 
\] (6)
Thus the advanced technology is adopted by any entrepreneur for whom \( \epsilon \in [0, \hat{\epsilon}] \), whilst the basic technology will be used by anyone else for whom \( \epsilon \in [\hat{\epsilon}, 1] \). Evidently, \( \mathcal{E}(\cdot) < 0 \) which means that an increase in bribe payments reduces the threshold input effort below which it pays to invest in the advanced project.

### 3.2 Aggregate Outcomes

Having described the individual behaviour of agents, we may now proceed to determine the process by which growth takes place in the economy. This process is obtained from the dynamic path of capital accumulation which may be derived as follows.

The aggregate amount of capital produced in each region comprises the total production of capital from the advanced investment project plus the total production from the basic investment project. Recall form above that the former venture is chosen by entrepreneurs for whom \( \epsilon \in [0, \hat{\epsilon}] \), whilst the latter venture is chosen by entrepreneurs for whom \( \epsilon \in [\hat{\epsilon}, 1] \). The populations of these groups are therefore:

\[
(1 - \eta)n \int_0^{\hat{\epsilon}} f(\epsilon) \, d\epsilon = (1 - \eta)n\hat{\epsilon} \quad \text{and} \quad (1 - \eta)n \int_{\hat{\epsilon}}^1 f(\epsilon) \, d\epsilon = (1 - \eta)n(1 - \hat{\epsilon}),
\]

respectively. Each member of each group produces the same amount of capital in accordance with (4) – that is, either \( \Phi l_t \) or \( \phi l_t \). It follows that the aggregate stock of capital in each region is given by

\[
K_{t+1} = [\Phi \hat{\epsilon} + \phi(1 - \hat{\epsilon})](1 - \eta)n l_t
\]

(7)

To obtain an expression for the growth rate of capital, we need to determine the amount of funding available to project investors. This funding is provided as loans from households and bureaucrats out of their first period incomes. Each of the former earns a wage of \( w_t \) from supplying its labour to output producers, whilst each of the latter earns a salary of \( s_t \) from supplying his labour to the government. We assume that public sector pay is financed by lump-sum taxes, \( \tau_t \), on private individuals such
that each household ends up with a net income of \( w_t - \tau_t \) to dispose of as a loan. The total amount of household lending is therefore \( N\eta n(w_t - \tau_t) \).

In addition to their salaries, bureaucrats receive bribe payments from firms through their rent-seeking activities. In general, corrupt individuals may seek to conceal their illicit practices in a number of ways, such as hiding their illegal income, investing this income differently from legal income and altering their patterns of expenditure. For the purposes of the present analysis, we assume that, because of such behaviour, only legal income is lent to firms, whilst illegal income is disposed of in some other (clandestine and non-productive) way. Accordingly, each bureaucrat’s size of loan is simply \( s_t \), so that total lending by all bureaucrats is \( ms_t \).

Aggregating over all lenders gives the amount of funds available to project investors. In doing this, we make use of the government’s budget constraint, \( N\eta n\tau_t = ms_t \), to arrive at a final expression for the total volume of loanable funds - namely, \( N\eta nw_t \). Since the total demand for funds is \( N(1 - \eta)n\ell_t \), equilibrium in the loan market implies \( \eta w_t = (1 - \eta)\ell_t \), implying that \( \frac{K_t + 1}{\frac{K_t}{1 - \eta}n} = \Phi \eta \) from (7). Given the expression for \( w_t \) in (2), \( w_t = \omega k_t \), where \( k_t = K_t/(1 - \eta)n \), we may compute the constant, endogenous equilibrium growth rate, \( \frac{K_{t+1}}{K_t} = g \). That is,

\[
g = \left[ \Phi \hat{e} + \phi(1 - \hat{e}) \right] \frac{\eta \omega}{1 - \eta} \equiv G(\hat{e}) \tag{8}
\]

Evidently, \( G'(\cdot) > 0 \) which shows that the higher is the critical level of effort the higher is the rate of growth because the greater is the number of entrepreneurs who choose to take on the more advanced (i.e., more productive) investment project.

**Proposition 1** An increase in bribe payments reduces equilibrium growth.

**Proof.** From (6) and (8), the equilibrium growth rate can be written as \( g = G[\mathcal{E}(Mb^P)(B)] \equiv G(B) \). Hence \( g'(\cdot) = G'(\cdot)\mathcal{E}(Mb^P)(\cdot) < 0 \). ■
The effect of bribe payments is to make the advanced investment project more costly, less profitable and therefore less attractive to entrepreneurs. The higher are these payments, the fewer is the number of entrepreneurs whose required input of effort is low enough to induce them to take on this project. Growth is reduced as a result. In short, corruption impedes growth by distorting investment decisions and limiting access to the most productive technology. There is, of course, an obvious implication of this.

**Corollary 1** The growth rate of a corrupt economy is always lower than the growth rate of a non-corrupt economy.

**Proof.** The growth rate is $g = G(B)$. Since $G'(B) < 0$, then $G(B) < G(0)$ for any $B > 0$.

With these results in mind, we now turn to consider how bribe payments themselves are determined.

**4 Rent Seeking Under Alternative Bureaucratic Structures**

The main purpose of our analysis is to examine whether the adverse effect of corruption on growth may depend on the administrative arrangements for implementing public policy. The particular types of arrangement that we are interested in are centralised and decentralised bureaucratic structures.

As mentioned earlier, decentralisation can take place to varying degrees along different dimensions and it is important to be clear about what precisely one means when considering the issue. The specific focus of the present chapter is the following. By a centralised bureaucracy, we mean a system of central administration whereby public officials have no regional affiliation in the issuance of licenses, but rather supply whatever licenses they are in charge of to applicants form any district: in other words, each bureaucrat, or bureau, is a provider of a particular type of license, or set of licenses, to all localities.
By a decentralised bureaucracy, we mean system of regional administration whereby public officials have local responsibility for license distribution, being allocated to districts over which they have complete jurisdiction: in other words, each bureaucrat, or bureau, is a provider of all types of license to a particular region, or regions.

To fix ideas, we suppose that in the case of centralisation each bureaucrat is given responsibility for the same number, \( \frac{M}{m} \), of distinct types of license, whilst in the case of decentralisation each bureaucrat is given jurisdiction over the same number, \( \frac{N}{m} \), of different regions. The main assumption that we make in this set-up is that bureaucrats do not share control of either the same license or the same region. This assumption rules out potential competition between officials in the provision or license: a bureaucrat in a central administration is a monopoly supplier of one or more licenses to all regions, whilst a bureaucrat in a decentralised administration is a monopoly supplier of all licenses to one or more regions.

### 4.1 The Returns from Corruption

Under both types of administrative arrangement, a bureaucrat issues a license only in return for a kickback, agreed as some fraction, \( b \), of a firm's profit, \( \pi_{t+1} \). As in other analyses, we assume that bureaucrats, whilst never being caught, incur some cost from their corrupt activities. These costs may be thought of in a number of ways. For example, corrupt public officials may need to spend effort and resources on arranging and concealing their illicit transactions, and may also experience some moral shame or social stigma from abusing their privileged positions. It is plausible to imagine that these costs are higher, the larger is the scale of the offence, as measured by the amount of bribe demanded for each license, \( b\pi_{t+1} \). It is also conceivable that the extraction of more bribe income is more costly for a bureaucrat if this occurs as a result of an increase in \( b \) rather than an increase in \( \pi_{t+1} \). This is because the former reflects a bureaucrat's own individual choice to extort more profit for himself, whilst the latter is an event from which all bureaucrats stand to gain equally without intention. Thus, given the behaviour of others, a bureaucrat who raises his own bribe demands may be expected to incur higher costs not only because of the absolute increase in the scale of
his offence, but also because of the relative increase in this - a factor that my make him more vulnerable to detection unless he spends more resources on concealing his activities, and that may even be costly in terms of attracting greater stigma and hostility.

For these reasons, we specify the cost of bribe-taking as $\beta(b)\pi_{t+1}$, where $\beta(b)$ is some convex function which satisfies $\beta(b) = b$ at both $b = 0$ and some $b = b^* > 0$. These properties ensure that, at least up to some level of bribe, a bureaucrat's net payoff (income or utility) from each bribe transaction is positive - that is, $[b - \beta(b)]\pi_{t+1} > 0$ for $b \in [0,b^*]$.\(^8\)

Given the above, the total returns to a bribe-taking bureaucrat may be deduced as follows. Recall that in a centralised administration each official has responsibility for $\frac{M}{m}$ licenses which he supplies to all of the $N$ regions, whilst in a decentralised administration each official has jurisdiction over $\frac{N}{m}$ regions which he provides with all of the $M$ licenses. In both cases the potential number of bribe-payers in any region is $\hat{\epsilon}(1 - \eta)n$, the population of entrepreneurs who choose the advanced investment project. Since the profit that each one of these licenses earns is $\pi_{t+1} = r\Phi l_t$, the return to a bureaucrat from each bribe transaction is $[b - \beta(b)]r\Phi l_t$. It follows that the total return from all bribe transactions under either form of administrative arrangement is

$$P = \hat{\epsilon}[b - \beta(b)](1 - \eta)n \left(\frac{NM}{m}\right)r\Phi l_t$$

(9)

The decision problem for each corrupt public official is to choose a bribe rate, $b$, so as to maximise his payoff, $P$. Whilst the expression for $P$ is the same under both types of bureaucratic structure, the solution to the maximisation problem is different. The reason for this, and the implications thereof, are elucidated in the analysis that follows.

4.2 Centralisation versus Decentralisation

\(^8\) This follows form the convexity of $\beta(\cdot)$, implying that $\beta'(\cdot) > 0$ and $\beta''(\cdot) > 0$. In addition, $\beta'(\cdot) < 1$ and $\beta'(b^*) > 1$. 

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The key difference between alternative administrative arrangements is the extent to which bureaucrats take into account the aggregate consequences of their own individual rent-seeking behaviour. As shown in (9), a bureaucrat’s payoff from such behaviour depends on both the bribe rate that he sets (i.e., \( b \), the share of profit extracted from each entrepreneur in return for each license) and the bribe base that is available to him (i.e., \( \bar{\epsilon} \), the fraction of entrepreneurs in each region who are willing to pay bribes). From (6), the latter is determined according to \( \hat{\epsilon} = \mathcal{E}(B) \), where \( B = Mb \) (the total share of profits that an entrepreneur must forfeit in return for all of the requisite licenses).

In the case of a centralised bureaucracy, entrepreneurs in any particular region obtain different licenses from different officials, each of whom chooses his own bribe demand, \( b \), taking as given the bribes demanded by others and hence the total rate of extortion, \( B \), that each firm suffers. As a result, each official perceives that his own corrupt behaviour has no influence on \( \hat{\epsilon} \). By contrast, in the case of a decentralised bureaucracy, entrepreneurs in a particular region obtain all of the different licenses from the same official who therefore recognises that \( B = Mb \) when choosing \( b \). Consequently, each official now perceives an influence of his rent-seeking on \( \hat{\epsilon} \). This distinction between administrative structures has important implications, as we reveal below.

Let \( b^C \) and \( b^D \) denote, respectively, the optimal bribe rates under centralised and decentralised bureaucracies. The former is computed as the value of \( b \) that maximises \( P \) in (9), taking as given \( \hat{\epsilon} \). That is,

\[
1 - \beta'(b^C) = 0 \quad (10)
\]

The latter is computed as the value of \( b \) that maximises \( P \) in (9), subject to \( \hat{\epsilon} = \mathcal{E}(Mb) \) in (6). That is,

\[
\mathcal{E}(Mb^D)[1 - \beta'(b^D)] + M\mathcal{E}(Mb^D)[b^D - \beta(b^D)] = 0 \quad (11)
\]
In each of the cases it follows from the properties of $\beta(b)$ that $b^i < b^*$ and therefore $b^i - \beta(b) > 0 \text{ (} i = C, D \text{)}$, implying a positive payoff from bribery.\(^9\) It is also evident that the optimal bribe rate is consistent in each case, as we claimed earlier.

A comparison of (10) and (11) yields the following result.

**Proposition 2** The bribe rate under decentralisation is lower than the bribe rate under centralisation.

**Proof.** Recall that $\mathcal{E}(\cdot) > 0$, together with $b^i - \beta(b) > 0 \text{ (} i = C, D \text{)}$. Suppose that $b^D \geq b^C$. Then (10) would imply $\beta'(b^D) \geq 1$, in which case (11) would require $M \mathcal{E}(Mb^D)(b^D - \beta b^D) \geq 0$ which is never satisfied. Hence $b^D \geq b^C$ cannot be true. Suppose, alternatively, that $b^D < b^C$. Then (10) would imply $\beta'(b^D) < 1$, in which case (11) would require $M \mathcal{E}(Mb^D)(b^D - \beta(b^D)) < 0$, which is satisfied. Hence $b^D < b^C$ is the only feasible outcome. \(\blacksquare\)

The intuition for the result is that bureaucrats with regional authority for the provision of licenses recognise that the bribe rate they set influences the bribe base they can exploit. Specifically, each official takes account of the fact that an increase in the amount of bribe demanded reduces the number of bribe-paying firms in the region (or regions) over which he has jurisdiction. The effect of this is to temper the demand for bribes, an effect that is absent when license provision is centralised and bureaucrats treat the number of potential bribe payers as given.

Given the above, it is straightforward to deduce the growth implications of alternative bureaucratic structures.

**Corollary 2** Growth is higher under decentralisation than under centralisation.

**Proof.** The growth rate is $g = G(B) = (Mb)$, where $G'(\cdot) < 0$. Since $b^D < b^C$, then $B^D < B^C$ so that $G(B^D) > G(B^C)$. \(\blacksquare\)

\(^9\) That $b^D < b^*$ may be seen from (11) which implies that a bureaucrat’s payoff is decreasing at $b^*$ (since $\beta(b^*) > 1$ and $b^* = \beta(b^*)$).
The fact that bribe payments are lower when license provision is decentralised than when it is centralised means that the cost of undertaking the advanced investment project is also lower in the case of the former than in the case of the latter. A lower cost of this more productive venture encourages a greater number of firms to take it on, which leads to a higher rate of capital accumulation and a higher rate of growth.

The foregoing results provide an illustration of how the effects of corruption may depend on the administrative structure (degree of centralisation) for implementing public policy. There is a close resemblance between these results and certain others that have been obtained in a different context that relates to the behavioural aspects (degree of organisation) of bureaucratic rent-seeking.

The seminal contribution on this was provided by Shleifer and Vishny (1993) who argued as follows. Suppose (as in our analysis) that, in order to conduct business, individuals must acquire various types of governmental goods (licenses, permits, certificates, etc.) that are compliments to each other and that are provided by different government agencies or departments. Under such circumstances, the extent to which public officials are organised in their extraction of bribes can have an important influence on the consequences of bribery.

In the case of disorganised (or non-coordinated) rent-seeking, each bureaucrat acts as an independent monopolist, supplying his own governmental good in exchange for a bribe which he chooses so as to maximise his own illegal income without taking into account the negative externality that this imposes on the demand for other governmental goods and the bribe-taking capacity of other bureaucrats. By contrast, in the case of organised (or coordinated) rent-seeking, bureaucrats act together as a joint monopoly, choosing bribe payments that maximise their total illegal income whilst internalising any externalities. The implication is that the level of bribes will be lower, the provision of governmental goods greater and the scale of distortions will be smaller when corruption is organised than when it is disorganised.
Our analogous result in the present paper is that corruption is less harmful when bureaucratic authority is decentralised than when it is centralised. Note that, in each of these cases, bureaucrats are treated as acting independently and are not assumed to coordinate their bribe-taking in any way. Nevertheless, by empowering public officials with regional jurisdiction, decentralisation in our model produces exactly the same rent-seeking behaviour as would occur in centralised bureaucracy with organised corruption. This is because the problem facing an independent regional official in the case of the former – maximise $P$ in (9) subject to $\bar{\epsilon} = E(Mb)$ in (6) – is identical to the problem facing a centralised syndicate of officials with the objective of maximising either the individual payoff of each of its members or the aggregate payoff of all its members. The outcomes in the two cases are observationally equivalent, even though the behavioural assumptions are quite different.

5 Conclusions

The aim of this chapter was to investigate the relationship between corruption, decentralisation and economic growth from a macroeconomic perspective. This was done by comparing and contrasting the macroeconomic implications of corruption in alternative bureaucratic structures using a dynamic equilibrium model of economic growth through capital accumulation.

It was argued that, since local government officials are considered to be better informed about the needs of the local community, they may also be in a better position to recognise the effects of their corrupt behaviour on economic outcomes within their jurisdiction. This feature occurs endogenously in this model since, in a decentralised system, government officials are able to internalise the negative externalities caused by their illicit behaviour. As result they have an incentive to limit their corrupt bribe demands. This in turn leads to a more favourable investment climate in which entrepreneurs are encouraged to investment in more productive technologies, which ultimately leads to a higher growth rate in the economy.

Although some authors have mentioned the possibility of this result, this analysis represents the first formal macroeconomic model with this feature, and in some
respects represents a reverse of the conclusions of many previous studies. Since the
publication of Shleifer and Vishny (1993) it has become common to associate
decentralisation with a more disorganised rent-seeking environment which is more
harmful to economic activity. However here it is shown that, as long as reforms are
implemented in certain ways, decentralisation can have the opposite effect, generating
outcomes that are in fact identical to those of organised corruption. It must be
stressed, however, that much depends on the establishment of a clear division of
functions, authority and responsibility in order to avoid overlapping jurisdictions and
the ensuing confusion.

Another implication of this analysis is that, in developing countries where corruption
may be endemic and capacity is lacking at lower levels of government, even limited
forms of decentralisation can have positive effects on reducing the level of corruption
on increasing economic growth. These results arise without appealing to the
disciplining effects of interjurisdictional competition or improved democratic
accountability (both of which may be missing in developing countries).

In many developing countries where central governments are reluctant to give up
substantial power, reforms tend to be more limited, closer to administrative
deconcentration than full decentralisation we find in many high income countries.
However, according to our model, even if corrupt revenues must be "kicked" further up
the bureaucratic ladder to regional or central officials, the fact that those demanding
bribes are able to internalise the effects of their behaviour means that the bribes
demanded should still be lower than the centralised rate.

The results provide additional insight into the complex, multifaceted issue of
decentralisation and corruption. Naturally, the analysis has been based on certain
assumptions, some of which are more important than others. In particular, the form of
decentralisation modelled here represents a highly stylised view of decentralisation.
However, it seems plausible that the underlying principles could also be valid for other
forms of decentralisation.
CHAPTER 2: DELEGATION, ACCOUNTABILITY AND CORRUPTION

1. Introduction

Over the last two decades decentralisation has become an important reform in many developing countries (see, e.g. Shah 2012). It is widely proposed as a way to create a more efficient and democratic government that can enable low income countries to overcome numerous obstacles to development. When promoting decentralisation it is common to use more advanced countries to highlight how effective decentralisation can be. However, while decentralisation is generally regarded as having been successful in developed countries, the verdict is less certain in the developing country context (Nupia 2007). In terms of realising many of the stated objectives of reform (such as advancing democracy, improving governance and promoting economic development), its record is at best mixed (Bardhan and Mookherjee 2006). Corruption at the local level has become a particular concern (Asthana 2013; Olken 2007; Reinikka and Svensson 2004).

Despite considerable research, both theoretically and empirically, the relationship between decentralisation and corruption remains ambiguous. There are a variety of avenues through which decentralisation can potentially affect the level of corruption. While some of these may reduce corruption, others may increase it. Indeed, there are likely to be multiple effects occurring simultaneously, so that trade-offs occur (Fan et al. 2009). This suggests that decentralisation can potentially be a route to improved governance and increased prosperity, but only if carried out carefully. In this chapter one such trade-off is highlighted and the conditions under which the benefits from decentralisation outweigh the costs are identified.

One of the main advantages of decentralisation is that, by bringing the government closet to the people, it can improve information problems associated with large and overly centralised government agencies (Oates 1972). The World Bank (2000) claims that decentralisation can be a powerful tool for achieving development goals in ways that respond to the needs of local communities, by assigning control rights to people
who have the information and incentives to make decisions best suited to those needs, and who have the responsibility for the political and economic consequences of their decisions.

Introducing a functional system of decentralisation is a demanding task that must be undertaken carefully. There are several potential pitfalls policy makers must be wary of. One of the main concerns is that, by increasing the discretionary power of bureaucrats, decentralisation may create new opportunities for corruption (Prud'homme 1995). If reforms are not designed carefully, decentralisation may result in a loss of control and oversight over local governments who may not be under the same scrutiny as more established central government agencies (Tanzi 1995).

This chapter presents a model which captures these two important features of decentralisation. On the one hand, it may alleviate the information problems that central government officials are subject to. On the other hand, it may also increase the discretionary power of bureaucrats. As such, a trade-off emerges, meaning that decentralisation has the potential to either increase or decrease the level of corruption, and to either impede or foster economic performance. A main objective of the model is to identify conditions under which these different outcomes may arise.

2 Literature Review

2.1 Empirical Evidence

The empirical evidence on the effect of decentralisation is fundamentally limited by data constraints since there is no clear way to fully measure the extent of decentralisation in a country, nor accurately track changes in it. Perhaps not surprisingly, therefore, the results of studies that have addressed the issue are rather mixed. Huther and Shah (1998) find that decentralisation increases the overall quality of governance, including reduced levels of corruption. However, a limitation of their approach is that they examine unconditional correlations between decentralisation and quality of governance, whereas it is well known that richer countries are generally more decentralised and generally better governed. Goldsmith (1999), Treisman (2000)
and Kunicova and Rose-Ackerman (2005) all find that a federal structure is associated with higher perceived levels of corruption. De Mello and Barenstein (2001) report that a range of governance indicators improve as the share of subnational government spending in total spending increases. Similarly, Fisman and Gatti (2002), controlling for GDP and many other factors find that decentralisation reduces corruption, using legal origin as an instrument to overcome endogeneity problems. However the validity of this instrument is questioned by Bardhan and Mookherjee (2006). Treisman observes that the relationship between decentralisation and corruption is highly sensitive to the control variables used, casting doubts on earlier studies. Arikan (2004) analyses decentralisation measures on Transparency International’s Corruption Perception Index in a cross-country dataset and finds levels of corruption to be lower in decentralised countries, though Lessmann and Marwardt (2010) argue that the analysis fails to adequately tackle the problem of endogeneity. Lederman et al. (2005) use a panel dataset for several developed and developing countries, together with the International Country Risk Guides (ICRG) corruption index. They find that central government’s transfers to sub-national governments decrease corruption. Dreher (2006) reports that decentralisation is consistent with improvements in a number of key governance indicators, whilst subsequent work by Nupia (2007) (using the same dataset as Fisman and Gatti 2002) shows that the beneficial impact of decentralisation on corruption is harder to detect in developing countries that developed countries. Enikolopov and Zhuravskaya (2007) report that governance indicators improve when fiscal decentralisation is combined with strong national parties. Fan et al. (2009), using cross section data of 80 countries, find that reports of bribery are more frequent in countries with a large number of tiers; unlike other studies based on perception data, this study uses experiential data from the World bank Economic Survey of bribery reported by business people. Lessman and Markwardt (2010), in a study encompassing a dataset of 64 countries, conclude that decentralisation reduces corruption where there is press freedom, but otherwise increases corruption. Finally, Kyria and Roca-Soyales (2011) find that decentralisation has a positive impact on the quality of government in OECD countries, whilst Altunas and Thornton (2012) make a similar observation and attribute the improvement in governance to a reduction in corruption.
For a variety of reasons (various sources of endogeneity bias, biased selection of samples, comparability of data, measurement errors and questionable quality of data) cross-country empirical studies fail to provide useful guidance relating to the effect of decentralisation on corruption. In a review of the empirical literature spanning 10 years, Treisman (2007) suggested that the effect of decentralisation on the reduction of corruption was not robust. Given the ambiguous results of empirical studies, it is necessary to analyse this relationship theoretically. In what follows we highlight several important avenues through which corruption can be effected by the extent of decentralisation.

2.2 Theoretical Arguments

2.2.1 Competition

According to many economists, one of the main virtues of decentralisation is that it introduces competition and thus some discipline into the public sector. Interjurisdictional competition can discourage local governments from engaging in corruption if such actions induce factors of production to flee to less corrupt jurisdictions (Brenna and Buchanan 1980; Shleifer and Vishny 1993; Weingast 1995; Montinola et al. 1995). Yardstick competition can also have the effect of disciplining elected representatives, who are afraid of being politically punished for underperforming in comparison to the elected representatives of nearby jurisdictions (Besley and Case 2006; Salmon 1987).

For these mechanisms to operate effectively certain conditions must be met. For instance, interjurisdictional competition requires the existence of mobile factors of production and of well-behaved common markets. These are often missing in developing countries (Litvack et al. 1998). Furthermore, in many developing countries it remains debatable whether a real alternative exists or whether individuals will simply be exposed to another group of predators (Bjedov et al. 2010).

2.2.2 Information and Discretionary Power
It is widely accepted that if decentralisation is carried out effectively, local governments should have lower transaction costs and less information problems (Fukasaku and de Mello 1999). However, in order to take advantage of superior discretionary power, local officials must be granted sufficient discretionary power, which can create new opportunities for corruption. An effective program of decentralisation requires that local governments be granted genuine autonomy over the decisions they make. The World Bank (2009), for example, argues that effective decentralisation requires that local governments be granted power to regulate economic activity within their jurisdiction and to enter into various types of contracts with the private sector.

2.2.3 Local Capture

Bardhan and Mookherjee (2000) put forward several reasons why local government may be inherently more prone to capture. Firstly, at lower levels of government the intimacy and frequency of interaction between officials and private agents is greater which can lead to the development of cosy relationships with local elites. Furthermore, at the local level interest groups may be more cohesive, the press may be less professional or easily bought, while elections and other issues may get less coverage. All of these suggest decentralisation may leave local elites with greater power and discretion to choose policies and allocate resources in ways that favour their own network of clients, friends and family, thereby increasing favouritism, prejudice and nepotism. Blanchard and Shleifer (2000) and Sonin (2003) present models suggesting strong administrative control by the central government is essential to avoid this problem. Enikolopov and Zhuravskaya (2007) provide empirical support that a strong centre is vital for decentralisation to be effective in reducing corruption.

2.2.4 Accountability

To ensure that this discretionary power is not abused, it is vital to introduce accountability mechanisms at the local level. Accountability is not an automatic outcome of decentralisation. Governments need to make a conscious effort to create structures that will hold local governments answerable to its citizens. Unfortunately,
it is commonly observed that in many developing countries decentralisation reforms are associated with increased discretionary power without the introduction of accompanying accountability mechanisms (World Bank 2008a). Nupia (2007) argues that the lack of success of decentralisation in combating corruption in these countries can be explained by a weakness of such mechanisms, particularly at the local level.

The key question in recent theoretical research has been whether decentralisation can reduce corruption by improving accountability (Bjedov et al. 2010). The two essential elements of accountability are public accountability, where public officials are answerable to other officials, and social accountability, where public officials are answerable directly to the citizens (World Bank 2007b).

Public Accountability
Public accountability includes setting clearly defined rules, responsibilities and standards of control for local governments, together with effective monitoring practices. One approach, for example, is to use performance-based transfers, according to which the central government makes the provision of inter-governmental transfers conditional on some predefined performance measures. In Uganda, for instance, the Local Development Grant program stipulates that only those local governments that meet certain minimum governance criteria can access funds for capital investments. This program has successfully improved planning, financial management, accountability and transparency in such projects (World Bank 2007b).

Social Accountability
According to many observers, improvements in social accountability are one of the main benefits of decentralisation. The argument is based on the premise that decentralisation, by bringing the government closer to the people, will empower citizens to exert pressure on public officials by pushing for better government performance (Boix et al. 2003; Klitgaard 1998; McGuire 2010). Seabright (1996) suggests that decentralisation will increase social accountability since citizens will generally be better informed about the activities of local governments and therefore better placed to reward or punish local politicians according to their performance. Similarly, Rose-Ackerman (1999) argues that smaller constituencies facilitate the
monitoring of the performance of elected representatives and public officials and reduce the collective action problems related to political participation. Thus, decentralised political systems have the potential for stronger social accountability mechanisms.

The proposed improvements in social accountability require reasonably free and fair elections at the local level. The problem in developing countries is that local governments may not be elected, and even when they are the vote is often influenced by local elites or subject to pressures from the centre (Prud’homme 1995; Tanzi 1995). It is therefore vital for decentralisation reforms to include effort to improve local democratic institutions.

Improving social accountability also entails making information on government performance more accessible to the public. The media is therefore vital in this regard (Brunetti and Weder 2003; Freille et al. 2007). However, at the local level, the media may be underdeveloped and there may be a tendency toward the development of clientilistic networks and elite capture (Bardhan and Mookherjee 2006; Manzetti and Wilson 2007).

These accountability mechanisms can help ensure that decentralisation can be effective in improving governance and reducing corruption, rather than merely transferring corruption to lower levels of government. However, such desirable outcomes are not inevitable, but rather require concerted effort on the part of policy makers. One of the main problems with decentralisation in developing countries is the near absence of accountability mechanisms, or the ineffective functioning of them when they do exist (Prud’homme 1995). Failure to incorporate them in decentralisation reforms is evidenced in a variety of case studies (World Bank 2003a; 2003b; 2008b). For instance, administrative courts (described as one of the most important instruments of accountability) are either absent or are not accessible to large portions of the population. Other accountability mechanisms (such as monitoring of public service delivery and procurement) are also not present at the local level in many developing countries. These observations are often used to explain why
decentralisation has often led to disappointing outcomes in a developing country context (Bjedov et al. 2010).

The theoretical analyses above highlight the complex nature of the relationship between decentralisation and corruption. It can be argued that, by bringing the government closer to the people, decentralisation can enhance accountability. It can also be argued that decentralisation will simply move corruption to the local level. Even worse, some have suggested that the increased autonomy of local governments may increase corruption due to the weakening of existing accountability mechanisms. Thus we can see that the results of decentralisation depend on the design and implementation of reforms and on the wider institutional environment.

The model presented in the following section is designed to capture some of the issue that occur when countries embark on a more extensive program of decentralisation than the administrative deconcentration described in chapter one. Here we analyse the effects of what might be described as fiscal delegation -where the authority over some fiscal functions are delegated to lower levels of government.

3 The Model

The theoretical framework presented in this chapter allows for the possibility that decentralisation can alleviate information problems whilst simultaneously reducing accountability. We consider an environment in which agents have an opportunity of investing in a risky enterprise (a production project) with the aid of public funds. Agents chose amongst a variety of production projects which differ according to their expected yields. Public funds are managed by bureaucrats who also issue the licenses that are required for projects to be undertaken. Agents and bureaucrats maximise their expected payoffs by drawing up (implicit) contracts to their mutual benefit. There are three potential sources of friction in the model - agents’ private local information about their choice of investment project, bureaucrats’ illicit appropriation of public funds and bureaucrats’ illicit demands for bribe payments. The extent of these frictions influences the nature of the contracts and depends on the particular structure of the bureaucracy, as determined by the particular form of decentralisation.
Four types of bureaucratic structure are analysed - two centralised and two decentralised. In the case of a centralised structure, the central government has control over the allocation of public funds, but lacks local information about agents’ choice of project. In the case of a decentralised structure, responsibility for distributing public funds is delegated to regional bureaucracies who have access to local information about project choice. In both scenarios, the degree of accountability in the management of public funds may be strong or weak, as reflected in the extent to which these funds are appropriated. As mentioned above, the contracts between agents and bureaucrats that transpire in each case are different, as are the outcomes to which they give rise: on the one hand, decentralisation can potentially enable bureaucrats to internalise the effects of their corrupt behaviour on agents’ investment decision; on the other hand, decentralisation may leave bureaucrats with more opportunities for corruption.

It is shown that decentralisation can improve economic outcomes if appropriate accountability mechanisms are in place at the local level. If not (as is the case for many developing countries), whether decentralisation improves outcomes may be the result of a trade-off whose resolution depends on whether information problems or bureaucrats’ discretionary power are more harmful to economic activity.

3.1 Private Agents

We assume that there are $m$ private agents who are allocated equally across $M$ regions with no mobility across regions. The total number of agents in each region is therefore fixed at $m/M$. Each agent in each region chooses between two types of productive activity: a safe, but relatively low-yielding, activity (e.g., subsistence production); and a risky, but potentially high-yielding, activity (e.g., entrepreneurship). Output from the former is given by $y = S$, with certainty, which is also an agent’s utility in this case. Output from the latter is determined as follows.

Risky production activity involves the operation of a project that is chosen from a variety of projects, the quality of which is indexed by $x$. We assume that higher quality
projects (indicated by a higher value of $x$), whilst potentially more productive, are also more risky. We capture this by defining $p(x)$ as the probability that a project succeeds, $1 - p(x)$ being the probability of failure, where $p'(x) < 0$. A project is undertaken with the aid of public funds (e.g., business grants), and there is $f$ amount of public funds available for each project. However, we assume that, depending on the quality of governance, a fraction $\phi$ of these funds may be embezzled by bureaucrats. Hence the actual amount of funds allocated to a project is $(1 - \phi)f$. Given these observations, the precise level of output produced from a given choice of project is as follows: with probability $p(x)$, the project succeeds and yields $y = x[(1 - \phi)f]^\alpha$ units of output; with probability $1 - p(x)$, the project fails and yields zero units of output.

In what follows we specify $p(x) = e^{-\pi x}$ as a convenient formulation for our analysis. The expected output from operating a risky project is then deduced to be

$$E(y) = e^{-\pi x} x[(1 - \phi)f]^\alpha \quad (1)$$

This implies a unique choice of project that maximises expected output - namely, $x^* = \frac{1}{\pi}$. For any $x < x^*(x > x^*)$, the gain in productivity from increasing $x$ is greater (less) than the corresponding reduction in probability of success so that it pays to increase (decrease) $x$. At $x^*$, this trade-off is optimised. If $\phi = 0$ as well, then expected output is at its highest level, $E(y) = \frac{f^\alpha}{e^\pi}$.

As indicated above, the operation of a risky project requires permission (licenses) from public officials who demand the promise of kickbacks in exchange for this permission if the project succeeds. An interesting issue in the literature concerns the question of how such bribe payments might be enforced. One possibility is the use of threats when private agents and public officials repeatedly engage with each other (e.g., the threat by the latter that future licenses will be withdrawn if the former do not comply in bribery). Another possibility is the use of fabricated claims that regulations have not been evaded (e.g., the reporting by officials that agents have set up business without complying with all the necessary procedures). Such behaviour is well documented in the literature (see e.g. Rose-Ackerman 1999). Whatever the reason, we assume that
the bribe demands of bureaucrats are honoured by agents, and we denote the bribe payment by \( b \). Given this, we may write the expected utility of a project investor as

\[
E(U) = e^{-\pi x} \{ x[(1 - \phi)f]^{a} - b \}
\]  

(2)

3.2 Public Officials

We assume that there are \( n \) bureaucrats in the economy, each of whom is given jurisdiction over \( \frac{M}{n} \) regions. Thus, if every agent undertakes an investment project, the maximum potential number of agents that each bureaucrat deals with is \( \frac{m}{n} \). In addition to any legal earnings (i.e., a salary), bureaucrats obtain income through two illegal means: the embezzlement of public funds and the acceptance of bribe payments. For each agent with whom he deals, a bureaucrat extracts an income \( \phi f \) from embezzlement and an income of \( b \) from bribery if a project succeeds. It follows that the total expected payoff to a bureaucrat from illicit activity is

\[
E(V) = \frac{m}{n} [ e^{-\pi x} b + \phi f ]
\]  

(3)

3.3 Contracts

We assume that bureaucrats draw up contracts with agents to maximise their own expected payoff. In doing this, bureaucrats must ensure the contracts are incentive compatible: that is, they must ensure that agents’ expected payoff from undertaking risky projects is at least as high as that from subsistence. If this condition is not satisfied, then agents will choose subsistence rather than project investment, meaning that bureaucrats will receive no income from bribes or embezzlement.\(^{10}\)

\(^{10}\) This modelling of bribes – which constitute part of the contract between agents and bureaucrats – can be likened to the case in which public officials receive kickbacks ex post in the form of a share of a company’s profits. That such arrangements exist in practice implies that, for one reason or another, firms find it worthwhile to adhere to their ex ante bribe promises. The enforcement of illicit agreements between private and public agents is an issue worth pursuing, though it is not one that we address explicitly in the present analysis.
The precise formalisation of contract design is presented below. For now, we note that there are two key determinants of contractual arrangements. The first is the structure of the bureaucracy, as defined by the extent to which bureaucratic powers are regionally decentralised. The second is the quality of accountability, as governed by the degree of bureaucrats’ autonomy in the disposal of public funds. The former affects the information available to bureaucrats about agents’ choice of investment project. The latter effects the opportunity for bureaucrats to appropriate resources to which agents are entitled. As we shall see, these factors interact with each other to produce different types of contractual arrangement and, with this, different outcomes in terms of economic performance.

4 Equilibrium Outcomes

We consider four alternative environments which differ according to the degree of centralisation and accountability. The first and second describe a centralised bureaucracy for which local (i.e., regional) information about project choice is unavailable. The third and fourth describe a decentralised bureaucracy for which project choices in a region are directly observable. The two alternatives in each scenario depict the cases of weak and strong accountability according to the intensity with which the government monitors bureaucrats’ management of public funds. The outcomes that transpire in these environments are distinguished notationally by $cn$ (centralisation and non-accountability), $ca$ (centralisation and accountability), $dn$ (decentralisation and non-accountability), and $da$ (decentralisation and accountability). The extreme cases are $cn$ (when information and monitoring are at their poorest quality) and $da$ (when information and accountability are at their highest quality).

The above scenarios are meant to capture the different circumstances faced by different countries and the different effects of different decentralisation programmes. For example, they represent cases where corruption is rampant and largely unchecked, where decentralisation is accompanied by anti-corruption strategies and where decentralisation is not accompanied by such strategies. In this way, we hope to
shed light on the importance of the careful design of decentralisation reforms. Details of the derivations of our result are contained in an Appendix.

4.1 Centralised Bureaucracy

As indicated above, the defining feature of a centralised bureaucracy in our analysis is the lack of local (regional) information. Specifically, we suppose that the distance and detachment between central government officials and local entrepreneurs means that the project choices of the latter are not directly observable by the former. Under such circumstances, bureaucrats have no direct control over \( x \) (which affects their expected payoff in (3)), but can influence this only by recognising how \( x \) is chosen by agents, as described as follows.

Each agent who takes on a risky project chooses a quality of project, \( x \), in order to maximise his expected utility. Formally, the problem is

\[
\max_x E(U) = e^{-\pi x} \{ x[(1 - \phi)] f^a - b \}
\]

The solution to this problem is given by

\[
x = \frac{1}{\pi} + \frac{b}{(1-\phi)f^a}
\]  \hspace{1cm} (4)

This expression shows that the existence of corruption in the form of bribe payments induces an optimal choice of project which deviates from the project that maximises expected output: that is, for any \( b > 0 \), we have \( x > \frac{1}{\pi} \). Bribe payments represent a fixed cost to an agent in the event that a project succeeds. The higher quality, but more risky, is the project the lower is the probability of success and the lower is the expected cost. This tends to raise the optimal choice of \( x \). The existence of corruption in the form of embezzlement compounds this effect: if \( b > 0 \), then \( \phi > 0 \) causes \( x \) to be raised even further in order to offset the lower returns from successful project investment.
4.1.1 Centralisation without Accountability

For the purposes of this paper, the absence of accountability is understood to mean the ability of government officials to embezzle a portion of their allocation of public funds at will. This may be close to the truth in many low income countries where corruption is rampant, and where the will and wherewithal to fight corruption are fairly low. Within this context, bureaucratic behaviour is described as follows.

The decision problem facing a bureaucrat is to choose a level of bribe, $b$, and an amount of embezzlement, $\phi$, so as to maximise his expected utility, subject to an agent's entrepreneurial participation constraint (i.e., the condition for the agent to undertake project investment, rather than work in subsistence) and the agent's optimising behaviour (i.e., the agent's optimal choice of investment project). Formally, the problem is

$$\max_{b,\phi} \quad E(V) = \frac{m}{n} \left[ e^{-\pi x} b + \phi f \right]$$

s.t. \quad $e^{-\pi x} \left\{ x [(1 - \phi)] f^\alpha - b \right\} \geq S$

$$x = \frac{1}{\pi} + \frac{b}{[(1 - \phi)] f^\alpha}$$

The optimal levels of bribery and embezzlement that solve this problem are given by

$$b^{cn} = \frac{1}{\pi} \left( \frac{\alpha}{e^{\pi} \pi} \right)^{\frac{\alpha}{1-\alpha}} \quad (5)$$

$$\phi^{cn} = 1 - \frac{1}{f} \left( \frac{\alpha}{e^{\pi} \pi} \right)^{\frac{1}{1-\alpha}} \quad (6)$$

These results reflect the trade-off facing bureaucrats when choosing each of their illicit actions, bribery and embezzlement: for any given $x$, an increase in either $b$ or $\phi$ raises their illegal income; but doing this has the effect of increasing $x$ which reduces their expected income. The values of $b^{cn}$ and $\phi^{cn}$ in (5) and (6) are those that optimise this trade-off.
Having established the above, we may now compute the quality of project and expected level of output that emerge in this environment. That is, from (4) and (1) in conjunction with (5) and (6),

\[ x^{cn} = \frac{2}{\pi} \]  \hspace{1cm} (7)

\[ E(y)^{cn} = \frac{2}{e^2\pi} \left( \frac{\alpha}{e^2\pi} \right)^{\frac{a}{1-a}} \] \hspace{1cm} (8)

### 4.1.2 Centralisation with Accountability

We now consider the case in which the centralised bureaucracy is accountable through the government’s close monitoring of bureaucrats’ management of public funds. Accountability can be established through appropriate structures in the bureaucratic hierarchy, where supervisors and legislative bodies are able to investigate the misuse of discretionary power by lower level bureaucrats. It may also arise from specially designed bodies, such as independent auditors who scrutinize the use of public funds for signs of misuse, ombudsmen who hear citizens’ complaints about bureaucrats’ behaviour, and specific bodies such as anti-corruption commissions. It may additionally be generated by fair elections and a free press. Whatever the case, we model accountability as a situation in which the opportunities to embezzle public funds are completely eliminated. Given this, bureaucrats design their contracts with agents as follows.

Setting \( \phi = 0 \) (the absence of embezzlement), a bureaucrat chooses his bribe demand, \( b \), so as to maximise his expected utility subject to the participation constraint and optimal project choice of agents, as before. That is,

\[
\max_{b, \phi} E(V) = \frac{m}{n} e^{-\pi x} b \\
\text{s.t.} \quad e^{-\pi x} (xf^\alpha - b) \geq S \\
x = \frac{1}{\pi} + \frac{b}{f^\alpha}
\]
Solving this problem yields the optimal bribe as

\[ b^{ca} = \frac{1}{\pi} + \frac{\alpha}{\pi} \quad (9) \]

Like before, (9) may be used in conjunction with (4) and (1) to derive expressions for the quality of project and expected level of output. That is,

\[ x^{ca} = \frac{2}{\pi} \quad (10) \]
\[ E(y)^{ca} = \frac{2f_{\pi}}{e^{2\pi}} \quad (11) \]

4.2 A Decentralised Bureaucracy

In contrast to the above, we suppose that a decentralised bureaucracy has access to local information that was previously unavailable. In particular, we assume that local government officials are able to directly observe the projects undertaken by entrepreneurs in the region over which they have jurisdiction. This means that local officials can impose their own choice of project subject to the argument of agents. In other words, \( x \) is under the control of officials so that (4) is redundant.

4.2.1 Decentralisation without Accountability

As mentioned earlier, it has been widely suggested that decentralisation, whilst having the potential to improve the business climate and foster economic growth, may also create obstacles to economic performance if it is implemented without due care and consideration. Contrary to the common assumption that decentralisation automatically enhances accountability, international experience illustrates multiple examples of accountability failures, leading to corruption and substandard service delivery. The World Bank (2008b) presents evidence from a variety of case studies suggesting that, in the majority of developing countries, decentralisation reforms have
not adequately incorporated accountability mechanisms\textsuperscript{11}. Kolstad and Fjelstad (2006) summarise a series of case studies exploring the results of decentralisation programs in Tanzania and Uganda. In both countries similar issues were highlighted. Local governments were found to be highly corrupt, with problems of coercion, extortion, bribery and, most of all, embezzlement. The fundamental problem was the high degree of discretionary power combined with poor (non-existent) monitoring from above\textsuperscript{12}. This was compounded by a lack of accountability due to limited democratic development and inadequate public awareness at the local level.

For decentralisation to be successful it is essential to ensure effective accountability mechanisms are in place at the local level. Building an accountability system that will work post-decentralisation will depend on ensuring reforms are carefully designed to include measures to increase transparency, participation and accountability to citizens at the local level. This includes provisions for clear fiscal reporting and citizen access to timely, accurate information, participation in public financial management and policy formulation, citizen budget monitoring, and independent commissions to handle citizen complaints. These efforts are difficult and take time to develop, particularly where the historical precedent is not well established.

Typical challenges to successful decentralisation include limited capacity, weak scrutiny by subnational legislatures, poor information systems, weak checks and balances, poorly organised civil society at the local level, and an absence of local media. Such weaknesses at the local level are understandable given the common history of centralised government in many countries, which leads to a tendency to focus these things in the centre, rather than at the local level.

It is therefore possible that accountability is diminished in the early stages of decentralisation reforms and that the potential benefits of these reforms may be realised only after new structures are put in place and are given time to operate

\textsuperscript{11} For instance, local administrative courts - one of the most important instruments of accountability - are either absent or are not accessible to large portions of the population.

\textsuperscript{12} In many cases no audits took place, or officials were responsible for auditing themselves. The Auditor General's office was under-staffed and under-qualified leaving it unable to effectively oversee the actions of subnational governments.
effectively. Against this background, we study the behaviour of a (recently) decentralised bureaucracy that has given rise to new opportunities for embezzling public funds.

The decision problem for each bureaucrat is to choose a quality of project, $x$, a size of bribe, $b$, and an amount of embezzlement, $\phi$, which maximise his expected payoff subject to the participation constraint of agents. The formal statement of this problem is

$$\max_{x,b,\phi} \quad E(V) = \frac{m}{n} [e^{-px}b + \phi f]$$

s.t. $e^{-px} \{x[(1 - \phi)f^a - b] \geq S}$

The optimal choices for project quality, bribery and embezzlement are given by

$$x^{dn} = \frac{1}{\pi} \quad \text{(12)}$$

$$b^{dn} = \frac{1}{\pi} \left( \frac{\alpha}{e^{\pi} \pi} \right)^{\frac{1}{1-a}} - eS \quad \text{(13)}$$

$$\phi^{dn} = 1 - \frac{1}{f} \left( \frac{\alpha}{e^{\pi} \pi} \right)^{\frac{1}{1-a}} \quad \text{(14)}$$

The expected level of output in this environment can be computed from (12), (14) and (1). That is,

$$E(y)^{dn} = \frac{1}{e^n} \left( \frac{\alpha}{e^{\pi} \pi} \right)^{\frac{a}{1-a}} \quad \text{(15)}$$

### 4.2.2 Decentralisation with Accountability

The final scenario that we consider is one in which the decentralised bureaucracy loses its opportunity to embezzle public funds. This may be because the central government is able to effectively monitor the management of public funds or because local
accountability mechanisms are in place. The implementation of such mechanisms is not a natural outcome of decentralisation, and it may take time before they become effective (if at all) (Tirole 1996; Bailey and Valenzuela 1997; Treisman 2000).

For instance, in terms of democratic accountability, it may take time for the population and media to appreciate the importance of local elections and local issues. The process of decentralisation may generate pressures for these mechanisms to arise, but not straight away. The results of a large decentralisation program in Indonesia highlight some of these issues. In the first years of decentralisation local electoral accountability was weak (Sherlock 2004; Ufen 2008). As a result, decentralisation appeared to merely disperse corruption to local governments (Ray 2003). Many local bureaucracies attained monopoly like positions – no longer under central government supervision but not yet under functional democratic control (Azis 2003). However, Rustiani (2003) finds that some local governments have made considerable progress in reducing corruption, particularly in the way they administer public infrastructure construction and business licenses. Luebke (2009) argues that these divergent outcomes are determined by the quality of government leadership. In particular, district heads motivated by electoral pressure and media exposure have been effective drivers of reform.

In Uganda it was found that up to 87% of educational grants from central government were being misappropriated by district governments (Reinikka and Svensson 2004a). This leakage was substantially reduced following a campaign to raise awareness of corruption at the local level. The campaign involved the central government publishing information on government fund allocations in newspapers in order to provide community members with the information necessary to monitor local governments themselves (Reinikka and Svensson 2004b). However, Olken (2005) describes a road building project in Indonesia in which grass-root monitoring failed to achieve such positive outcomes due to local capture and free-rider problems. When comparing the two cases, Kolstad and Fjeldstad (2006) conclude that grass-root monitoring maybe effective for programs in which community members have personal stake (e.g., education programs), but for other projects it may be necessary to employ other accountability mechanisms such as professional auditors.
The analysis that follows is essentially concerned with the situation in which accountability reforms have taken place.

Setting $\phi = 0$ (absence of embezzlement), the decision problem for a bureaucrat is to choose a quality of project, $x$, and a size of bribe, $b$, that maximise his expected payoff, subject to agents participation constraint. That is,

$$\max_{x,b} E(V) = \frac{m}{n} e^{-\pi x} b$$
$$s. t. \quad e^{-\pi x}(fx - b) \geq S$$

The optimal choices for project quality and bribe payments are deduced as

$$x^{da} = \frac{1}{\pi}$$  \hspace{1cm} (16)
$$b^{da} = \frac{fa}{\pi} - eS$$  \hspace{1cm} (17)

The expected level of output is computed in the usual way. That is, from (16) and (1),

$$E(y)^{da} = \frac{fa}{e\pi}$$  \hspace{1cm} (18)

5 Centralisation versus Decentralisation: An Evaluation

The foregoing analysis has established the equilibrium outcomes that transpire under alternative scenarios. In the final part of our analysis we compare and contrast these outcomes with the view to ranking the scenarios along various dimensions (incidence of corruption, project choice and economic performance) identifying the relative merits of decentralisation programmes$^{13}$.

$^{13}$Throughout our analysis, we assume that $f > \left(\frac{a}{a+\pi}\right)^{1/(1-a)}$ in order to ensure that $\phi > 0$ in (4) and (14).
Consider, first, the outcomes that arise for a given bureaucratic structure (either a centralised bureaucracy or a decentralised bureaucracy). As regards bribe payments, we find that $b_{ca} > b_{cn}$ and $b_{da} > b_{dn}$. As regards project choice, we observe that $x_{ca} = x_{cn} > x^{*}$ and $x_{da} = x_{dn} > x^{*}$. And as regards expected output, we have $E(y)^{ca} > E(y)^{cn}$ and $E(y)^{da} > E(y)^{dn}$. These results show that, ceteris paribus, greater accountability is associated with higher bribe demands but higher expected output as well. Bribe payments are higher when embezzlement is prevented since these payments are the only source of income for bureaucrats\textsuperscript{14}. But since the quality of projects is unaffected, the absence of embezzlement means higher expected output.

Consider, next, the outcomes that arise for a given level of accountability (either positive or zero embezzlement). For bribe payments, we infer that $b_{ca} > b_{da}$ and $b_{cn} > b_{dn}$. For project choice we find that $x_{ca} > x_{da} = x^{*}$ and $x_{cn} > x_{dn} = x^{*}$. And for expected output, we observe that $E(y)^{ca} < E(y)^{da}$ and $E(y)^{cn} < E(y)^{dn}$. These results show that, ceteris paribus, greater centralisation is associated with higher bribe demands, more risky project choice and lower expected output. Bribe payments are higher when the bureaucracy is centralised because of officials’ lack of direct control over project choice due to their lack of local information. The upward bias to project choice that results from this implies a lower probability of project success which bureaucrats compensate for by demanding higher bribe payments in the event of success. The same upward bias in project choice also means a downward bias in expected output.

Collecting the above results together, we may deduce the following: $b_{ca} > b_{ij} > b_{dn}$ for $ij = \{ca, da\}$, $x_{ca} = x_{cn} > x_{da} = x_{dn}$. and $E(y)^{da} > E(y)^{ij} > E(y)^{cn}$ for $ij = \{ca, dn\}$. The only ambiguities in these results concern $b_{cn} \geq b_{da}$ and $E(y)^{ca} \geq E(y)^{dn}$ for the reason alluded to above: in the case of the former, bribes tend to be higher under centralisation than decentralisation, but lower under non-accountability than accountability; in the case of the latter, expected output tends to be lower under accountability.

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\textsuperscript{14} That the bribe rate increases in the more accountable environment may seem somewhat paradoxical. One way of interpreting this result is as an illustration of how corruption can morph from one form to another as various anti-corruption policies are introduced, highlighting how hard it is to effectively eliminate corruption. In any case, this outcome is not important for the main thrust of this analysis.
From a purely economic performance perspective, the worst scenario is the combination of centralisation and non-accountability. In this case, the lack of local information, together with the freedom to loot public funds, induces bureaucratic behaviour that biases project choice and wastes productive resources. Conversely, the best scenario is the opposite combination of decentralisation plus accountability, for which expected output is at the level that it would be in the absence of any corruption. Under such circumstances, bureaucrats possess the local information that enables them to choose their preferred quality of project (which is the quality that maximises expected output for any given level of embezzlement), and are prevented from abusing their control over public funds (which ensures that expected output is at its maximum by ruling out embezzlement altogether). This result provides an illustration of the argument that decentralisation can work well when accompanied by appropriate accountability mechanisms. However, for many developing countries, a more realistic scenario is probably the combination of decentralisation without accountability. If accountability mechanisms are initially in place before decentralisation, but are subsequently not established at the local level, then the emergence of new opportunities for bureaucrats to appropriate public funds may have negative effects that more than offset the benefits from improvements in information. As such, policymakers must be wary of implementing decentralisation reforms that raise the discretionary power of bureaucrats, although this may be an unfortunate and unavoidable side effect of such reforms which may persist for some time before effective accountability mechanisms are put in place.

6 Conclusion

The analysis presented above highlights one of the potential trade-offs involved when a country decentralises some of the state’s functions to lower levels of government. In particular, it shows how decentralisation may have both positive and negative effects on economic performance through two distinct channels: on the one hand, by bringing the government closer to the people and improving access to local
information, decentralisation can foster more productive investment choices; on the other hand, by weakening the accountability and transparency of bureaucratic behaviour, decentralisation can foster counter-productive corrupt practices. The basic message of the analysis is that decentralisation may be good if accountability is good, but may not be so good otherwise.

Introducing accountability mechanisms at the local level may not be very easy. Local governments may lack capacity, local media may be ineffective, local elites may be too powerful and local elections may be flawed. It may be the case that decentralisation should not be attempted until progress in these areas has been made. This suggests that some of the least developed countries should be especially cautious when considering a program of decentralisation reforms.

A program of decentralisation should raise awareness that local governance matters and that incentives need to be given to create accountability mechanisms. However, it may take time for the general population to understand the new governmental structures, and so be able to identify which layer of government is responsible for which outcomes; it may take time for people to realise the significance and importance of local elections; and it may take time for the media to re-focus its attention on local issues. Before such events transpire, one might see an initial period where decentralisation does little or nothing (or even worse) to improve outcomes as corruption takes place at the local level unabated. This is a view taken by Crook and Manor (1998), and is supported by observations about corruption in water provision provided by Asthana (2012) who finds that corruption tends to initially increase after decentralisation before gradually decreasing over a subsequent period of time.
Appendix

A. Centralisation without Accountability

Substituting for $x$, the Bureaucrat’s problem can be re-stated as

$$\max_{b, \phi} E(V) = \frac{m}{n} \left[ e^{-\left(1+\pi b\left(1-\phi\right)\right)^{-\alpha}} b + \phi f \right]$$

s.t.  $$e^{-\left(1+\pi b\left(1-\phi\right)\right)^{-\alpha}} \frac{\left(1 - \phi\right)\alpha}{\pi} \geq S$$

The first-order and commentary slackness conditions are

$$b = \left(1 - \frac{n}{m} \lambda \left(\frac{\left(1 - \phi\right)\alpha}{\pi}\right)\right)$$  \hspace{1cm} (A1)

$$\frac{\pi b^2}{\left(1 - \phi\right)^{\alpha+1}} + \lambda \frac{n}{m} \frac{\left(1 - \phi\right)\alpha + nb}{\pi\left(1 - \phi\right)^{\alpha}} = e^{-\left(1+\pi b\left(1-\phi\right)\right)^{-\alpha}}$$  \hspace{1cm} (A2)

$$\lambda \left[ e^{-\left(1+\pi b\left(1-\phi\right)\right)^{-\alpha}} \frac{\left(1 - \phi\right)\alpha}{\pi} - S \right] = 0, \ \lambda \geq 0, \ \lceil \cdot \rceil \geq 0, \hspace{1cm} (A3)$$

Where $\lambda$ is a Lagrange multiplier.

Suppose that $\lambda > 0$, implying $e^{-\left(1+\pi b\left(1-\phi\right)\right)^{-\alpha}} \frac{\left(1 - \phi\right)\alpha}{\pi} = S$ from (A3). Given this, together with (A1) and (A2), one obtains $\phi = 1 - \frac{aS}{f}$. Appropriate substitution and manipulation may then be applied to find

$$E(V) = \frac{m}{n} \left[ e^{-\left(n - \frac{n\lambda}{m}\right)} \left(1 - \frac{n}{m} \lambda \right) \frac{aS^2}{\pi} + f - aS \right]$$

This expression implies that $E(V)$ is decreasing in $\lambda$. As such it is optimal to set $\lambda = 0$ which contradicts the initial supposition.
Suppose instead that \( \lambda = 0 \), implying \( e^{-[1+\pi b(1-\phi) f]^{-a} \frac{f^a}{\pi}} > S \) from (A3). Then (A1) and (A2) may be solved simultaneously to obtain the results in (5) and (6).

**B. Centralisation with Accountability**

Substituting for \( x \), the bureaucrat’s problem can be re-stated as

\[
\max_b E(V) = \frac{m}{n} e^{-(1+\pi b^{-a}) b}
\]

\[
\text{s.t. } e^{-(1+\pi b^{-a}) \frac{f^a}{\pi}} \geq S
\]

The first order and complimentary slackness conditions are

\[
b = \left(1 - \frac{n}{m} \mu\right) \frac{f^a}{\pi}, \quad \text{(B1)}
\]

\[
\mu \left[ e^{-(1+\pi b^{-a}) \frac{f^a}{\pi}} - S \right] = 0, \quad \mu \geq 0, \quad [\cdot] \geq 0, \quad \text{(B2)}
\]

Where \( \mu \) is the Lagrange multiplier.

Suppose that \( \mu > 0 \), implying \( e^{-(1+\pi b^{-a}) \frac{f^a}{\pi}} = S \) from (B2). Given this, together with (B1), we find that

\[
E(V) = \frac{m}{n} \left(1 - \frac{n}{m} \mu\right) S
\]

Evidently, \( E(V) \) is decreasing in \( \mu \) as such it is optimal to set \( \mu = 0 \) which contradicts the initial supposition.

Suppose instead, that \( \mu > 0 \), implying \( e^{-(1+\pi b^{-a}) \frac{f^a}{\pi}} > S \) from (B3). The (B1) yields the result in (6).
C. Decentralisation without Accountability

The first-order and complementary slackness conditions for the bureaucrat’s optimisation problems are

\[
\theta \left[ (1 - \phi) f^\alpha + \pi b - \pi x(1 - \phi) f^\alpha \right] = \frac{m}{n} \pi b , \quad (C1)
\]
\[
\theta = \frac{m}{n} , \quad (C2)
\]
\[
\theta a e^{-\pi x} = \frac{m}{n} (1 - \phi) f^{1-\alpha} , \quad (C3)
\]
\[
\theta [e^{-\pi x} \{ x(1 - \phi) f^\alpha - b \} - S] = 0 , \quad \theta \geq 0 , \quad [\cdot] \geq 0 , \quad (C4)
\]

where \( \theta \) is the Lagrange multiplier.

From (C2), \( \theta > 0 \) so that \( e^{-\pi x} \{ x(1 - \phi) f^\alpha - b \} = S \) by virtue of (C4). Combining (C1), (C2) and (C3) delivers the results in (12), (13) and (14).

D. Decentralisation with Accountability

The first-order and complementary slackness conditions for the bureaucrat’s optimisation problem are

\[
\psi(f^\alpha + \pi b - \pi x f^\alpha) = \frac{m}{n} \pi b , \quad (D1)
\]
\[
\psi = \frac{m}{n} , \quad (D2)
\]
\[
\psi [e^{-\pi x} (x f^\alpha - b) - S] = 0 , \quad \psi \geq 0 , \quad [\cdot] \geq 0 , \quad (D3)
\]

where \( \psi \) is a Lagrange multiplier.

From (D2), \( \psi > 0 \) so that \( (x f^\alpha - b) = S \) by virtue of (D3). Combining (D1) and (D2) delivers the results in (16) and (17).
CHAPTER 3: CORRUPTION, DECENTRALISATION AND ECONOMIC GROWTH: A PANEL DATA ANALYSIS

1. Introduction

The problem of poor economic performance in developing countries requires a long term strategy of improving governance (World Bank 2007). Achieving this is not an easy task. Among the many policy recommendations put forward, decentralisation is one of the most commonly prescribed (Shah 2012).

Waves of decentralisation have occurred in recent decades, fuelled by the belief that centralised states are inherently inefficient and unaccountable (Martinez-Vazquez and McNab 2003). The World Bank (2008a) estimates that some 95% of democracies now have elected subnational governments, while more and more countries are transferring political, fiscal and administrative power to subnational governments. Bardhan and Mookherjee (2006) present case studies covering over half the world’s population.

The redistribution of power through decentralisation is often proposed as way of decreasing corruption (Crook and Manor 1998). Indeed, a commitment to decentralisation has become an important element of donor supported anti-corruption strategies (World Bank 2000). The potential benefits of decentralisation, such as increased competition, improved information, and greater accountability, are widely viewed to be vital in fighting corruption (Jain 2001; Rose-Ackerman 1997; Shleifer and Vishny 1993).

The efficiency gains and/or reduction in corruption enabled by decentralisation are also touted as a potential means to improve economic growth (Martinez-Vazquez and McNab 2003). However, the relationship between decentralisation, corruption and economic growth is not clear. According to some observers, decentralisation has done little to improve governance, and the correlation between decentralisation, corruption and development is extremely weak (Crook and Manor 1998). While generally in
support of reforms, the UN (2000) notes there are instances when decentralisation is clearly dysfunctional.

It seems that decentralisation has had different effects in different countries. For instance, Bardhan and Mookherjee (2005) argue that decentralisation has been an important factor contributing to rapid growth in China since the early 1980’s. However, they suggest local governments have retarded growth in Russia since the 1990’s while in the context of Brazil and India, the effects vary across regions.

Decentralisation is a complex process; only if implemented in the right conditions and in the right way will these benefits arise. What’s more, there may be other, less favourable effects of decentralisation that can jeopardise these supposed benefits. While the overall effects of decentralisation remain unresolved, it appears the issue for most countries is not whether to decentralise, but how best to? (Taillant 1994).

It seems that, for developing countries, traditional theories may not be suitable for answering this question (Bardhan and Mookherjee 2005; Oates 2005; Weingast 2009). More recently a ‘second generation’ literature has developed focusing on how decentralisation affects accountability and incentives of government agents (Bardhan and Mookherjee 2005). However, the effect of decentralisation on governance and corruption within developing countries remains unclear.

While much attention has focused on corruption and growth and there is now a sizable literature on decentralisation and corruption, there has been very little research into the relationship between the three of them together. This chapter will attempt to analyse the relationship between corruption, decentralisation and economic growth empirically, using panel data techniques. The following section discusses the previous research on this issue. Section three explains the data to be employed in the investigation. Section four describes the methodology while section five presents the results.
2. Literature Review

2.1 Corruption and Economic Growth

Some of the early theories on corruption, and even some more recent analysis, describe situations in which the presence of corruption may be beneficial (Leff 1964; Leys 1964; Bayley 1966; Huntington 1968; Lui 1985). If an economy is hampered by an over-extensive bureaucracy, corruption can be a way of circumventing cumbersome red tape. In this functionalist view, corruption can be regarded as a rational market response to government failures (Aidt 2003). Although resources maybe spent on corrupt activities, the overall affect maybe welfare enhancing if the pre-existing policy induced distortions are significantly detrimental to economic growth. Corruption in such theories has often been described as "grease for the wheels" of inefficient governments (Bardhan 1997).

The efficient corruption arguments suggest corruption may be beneficial in a second best world because of the distortions caused by ill-functioning government (Meen and Sekkat 2005). Despite the plausibility of these arguments, they have been challenged on both the theoretical and empirical grounds (Aidt 2003).

Since the 1990's a large body of empirical evidence has developed indicating a negative relationship between corruption and economic activity (Mauro 1995; 1997; Tanzi and Davoodi 1997; Wei 1999; Mo 2001; Pelligrini and Gerlagh 2004). This has been achievable, despite the inherent difficulties associated with measuring corruption, due to the development of various corruption perception indices\(^\text{15}\). These indices rank

\(^{15}\) Several different corruption measures have been exploited in the literature. Some of the most widely used are formulated by Business International, Political Risk Services, Transparency International, and the World Bank. Business International Index is based on surveys of consultants. It ranks countries according to the degree to which business transactions involve questionable payments. Political Risk Services' International Country Risk Guide (ICRG) is based on indicators of corruption assembled by private risk-assessment firms. This captures the likelihood that government officials will demand illegal payments. The Corruption Perception Index (CPI) produced by Transparency International, an NGO dedicated to fighting corruption worldwide, is an average of ratings reported by a number of surveys measuring the perceived extent of corruption. The Control of Corruption Indices (CCI) produced by the World
countries according to the extent that corruption is perceived to exist. Despite the subjective nature of these indices, they have proved to be highly correlated with each other, and to be consistent over time, suggesting that biasedness is not a problem (Wei 1999).

The literature identifies five key transmission channels through which corruption has been found to impede economic growth:

1.) Physical Capital Investment
One of the main avenues through which corruption impedes economic growth is via its effect on investment in physical capital (Mauro 1995). Corruption can add to the cost of doing business and increase uncertainty regarding the returns on investment decisions, both of which can diminish the incentive to invest (Svensson 2005). Corruption can lead to misallocations of public expenditures towards less productive areas (Mauro 1997; Tanzi and Davoodi 1997). Wei (1997) finds that a major channel through which corruption impeded development is through reducing inflows of foreign direct investment (FDI).

2.) Human Capital
Corruption can impede human capital development by reducing tax revenues and adding to the costs of government, thereby diminishing the potential resources available for funding public services, such as health and education (Blackburn et al 2006; Mauro 1997; Mo 2001). Corruption also skews the composition of government expenditure towards types of expenditure that are open to manipulation, which typically does not include health and education (Mauro 1997; Tanzi and Davoodi 1997).

3.) Government Size
The impact of corruption on government size is ambiguous. On the one hand, corruption could increase government size as corrupt officials seek to maximise their rent-extracting potential (Tanzi and Davoodi 1997; Montinola and Jackman 2002). On

Bank is similar to the CPI but with a broader definition of corruption and slightly different method of aggregation (Wei 1999).
the other hand, corrupt officials’ attempt to maximise their rents could limit the amount of resources available for government (Elliot 1997).

4.) Trade Openness
Pelligrini and Gerlagh (2004) find empirical support for the argument that corrupt governments may resist movements towards greater trade openness because trade restrictions are an important source of rents for corruption officials.

5.) Political Instability
Corruption can create political instability by undermining the legitimacy of political institutions (Pellegrini and Gerlagh 2004). It has also been suggested that corruption fuels inequality (Blackburn and Forgues-Puccio 2007; Gupta et al. 2002; You and Khargam 2004) which may also encourage political instability (Mo 2001).

Other studies have suggested corruption may lead to a misallocation of resources away from productive activities towards rent-seeking (Acemoglu 1995; Acemoglu and Verdier 2000; Erlich and Lui 1999; Murphy et al. 1991). It may induce firms to undertake their activities in the informal sector where they are less efficient but less susceptible to corrupt behaviour (Erlich and Lui 1999; Sarte 2000; Svensson 2005; Aidt et al. 2007). Corruption can lead to a costly concealment of illegal incomes (Blackburn et al 2006) and may encourage governments to rely on seignorage to finance their activities (Blackburn et al. 2008; Blackburn and Powell 2011).

Corruption is also argued to play a critical role in generating poverty traps (Andvig and Moene 1990; Blackburn et al. 2006). Rose-Ackerman (1999) identifies several channels through which poor people are especially hurt by corruption. Firstly, the poor will may face higher taxes and receive a lower level of public services. Furthermore, their ability to escape poverty through small scale enterprise may be adversely affected if bribery makes it prohibitively expensive.

It should be noted that not all researchers are convinced by the robustness of the corruption-growth relationship. For example, Svensson (2005) questions the validity of
Mauro (1995) and argues that while there is considerable evidence at the micro level that corruption impedes growth, at the macro level the evidence remains inconclusive.

It has been pointed out that several countries have been able to maintain high growth rates for a prolonged period of time despite high levels of corruption (Wederman 2002; Campos et al. 1999; Rock and Bonnet 2004). This anomaly has been named the ‘East Asian Paradox’ since many of the countries involved are located in this region. In these countries it has been argued that corruption reduces investment (and therefore economic growth) by less (Campos et al. 1999). However, Wei (1999) disputes this claim.

More recent studies have highlighted some other complications in the corruption-growth relationship. Mendez and Sepulveda (2006) find a non-monotonic relationship between corruption and growth. Their cross-county investigation finds that corruption is beneficial at low levels but above a certain threshold it becomes detrimental to growth. Aidt and Sena (2008) find that corruption has a detrimental effect on growth only when the quality of institutions is high. In countries with low quality institutions, no such relationship is found. Aidt (2009) argues that the supposed corruption-growth relationship breaks down when a cross-national index of managers’ actual experience with corruption is used to approximate corruption rather than the standard analysis based on perception-based indices of corruption. However, it is found that corruption has a negative effect on growth in per-capita wealth.

Finally Campos, Ralitza and Saleh (2010) use meta-analysis techniques to systematically evaluate the evidence. Using a data set comprising 460 estimates of the effect of corruption on growth from 41 empirical studies they conclude that there is a genuine negative relationship between the two.

In summary, there now exists an extensive literature, the majority of which finds that there is a negative relationship between corruption and economic growth. However, due to the inherent difficulties associated with studies of this kind, some doubts remain as to the robustness of this relationship.
2.2 Decentralisation

Decentralisation involves the shifting of fiscal, political and administrative responsibilities from higher to lower levels of government. However, the details of reforms differ from country to country. The literature often refers to three types of decentralisation: deconcentration, delegation and devolution (Martinez-Vazquez and McNab 1998). Deconcentration is a process followed by central governments to increase effectiveness and flexibility in through regional or local offices of the central government. Delegation, mostly associated with unitary states, is a top-down process where the centre retains significant power while the subnational units have limited discretion and are still held accountable to the central government. Devolution, more associated with federal states, is a bottom up process in which the subnational units have more independence.

For each type of decentralisation, there is also a wide range of governmental functions that may or may not be decentralised. These can be categorised into fiscal, administrative and political. Fiscal decentralisation involves the transfer of decision making power for revenue generation and/or expenditure to lower levels of government. This can include the setting and collecting taxes, borrowing from higher government or markets and allocating expenditures on local services. Administrative powers include the authority to design and implement certain laws, regulations, grant licenses and permits. Whether the local government is elected by local residents or appointed by higher government also alters the possible mechanisms through which decentralisation operates.

Thus, decentralisation reforms can vary considerably from country to country. For example, in China we see delegation of economic responsibilities and legislative powers, but not political. In other countries such as India we have the opposite (Bardhan and Mookherjee 2005)

Decentralisation is closely related to, but not the same as, federalism. Federalism occurs when there exists both a central and separate subnational governments that may be subordinate to the centre in some matters but are independent of it in others. In contrast, decentralisation grants subnational governments authority in certain areas, but they do not possess any claim against the central government (Rubin 2001).
Finally, it is often the case that the traditional literature focuses on regional or provincial government one step below the national government, while the recent wave of decentralisation in developing countries often involves the empowerment of lower level government at the municipal or village level (Gurgur and Shah 2005).

2.3 Decentralisation and Corruption: Theory

Due to disappointment and frustration with inefficient and corrupt centralised governments, many developing countries have turned to decentralisation in order to broader improve governance and economic performance. For developing countries on average, the share of public sector expenditures allocated at the sub-national level increased from less than 13% in 1980 to about 20% in the late 1990s (Kolstad and Fjelstad 2006).

Evaluating the results of decentralisation is not an easy task. Case studies provide an important source of evidence but generalisations are not straightforward. Cross-country and panel-data studies suffer from serious data issues. It is important to emphasise the complexity of the relationship between decentralisation and corruption. The theoretical literature on the economics of decentralisation stresses the potential for both positive and negative effects on the quality of governance. Kolstad and Fjelstad (2006) suggest decentralisation may improve governance through three main channels:

1. One of the key advantages of decentralisation is that, by bringing government closer to the people it may improve information problems of government agents. Oates (1972) argues that decentralised governments will be better informed about local conditions and better able to satisfy citizen preferences.

2. Another key advantage is that decentralisation can introduce competitive pressures into government, which can potentially improve efficiency, and may help reduce corruption. Weingast (1995) and Montinola, Yingyi, and Weingest (1995) argue that fiscal decentralization means that economic agents have the ability to
leave more corrupt regions, which would tend to improve governance. World Bank (2004) suggests that the resulting competition between centres of authority reduces the risk that governments will expropriate wealth.

3. Another strand of the literature focuses on whether decentralisation can help improve accountability of government. Seabright (1996) suggests that decentralisation will increase democratic accountability since citizens will generally be better informed about the activities of local governments and therefore better placed to reward or punish local politicians according to their performance.

However the validity of the latter two channels can be questioned, especially in the developing country context. For competitive pressures to be effective in terms of improving governance it must be the case that (i) there is sufficient mobility of private agents between regions and (ii) that genuine alternatives exist between the regions rather than merely another inefficient and/or corrupt government.

For decentralisation to improve accountability certain questionable conditions must be met. There must be reasonably free and fair elections at the local level, a local media capable of informing the public on local governance issues and it must be clear to the public which layers of government are responsible for various outcomes of government decisions. However, Prud'homme (1995) suggests local government activities are less intensely monitored than central government activities, while Fukasaku and de Mello (1999) argue that expenditures and revenue mobilisation functions are often not clearly assigned across different levels of government. Furthermore, local governments often lack capacity, and it may take a while for this capacity to be developed after powers have been transferred. For these reasons granting new discretionary power to local governments may thus actually worsen accountability.

Another big problem identified is that decentralisation may lead to the capture of subnational governments by local elites. Bardhan and Mookherjee (2000), Tanzi (1995), and Prud'homme (1995) argue in persuasively that local officials are more susceptible to capture by local elites.
2.4 Decentralisation and Corruption - Empirics

The empirical evidence on the effects of decentralisation on corruption is fundamentally limited by data constraints since there is no clear way to measure fully the extent of decentralisation in a country, nor accurately track changes. However, several studies have attempted to find a relationship. Perhaps not surprisingly, the results of these studies are mixed.

In one of the earliest empirical studies on this issue Huther and Shah (1998) find that decentralisation increased the overall quality of governance including reduced levels of corruption. However, they examine unconditional correlations between decentralisation and quality of governance. It is well known that richer countries are generally more decentralised and that richer countries are also better governed, so that the unconditional correlation will be biased.

De Mello and Barenstein (2001) report that a range of governance indicators including corruption improve as the share of subnational government spending in total spending increases. Fisman and Gatti (2002) also find that decentralisation reduces corruption. However, the authors attempted to overcome the endogeneity problem by using legal origin as an instrumental variable. Bardhan and Mookherjee (2006) cast doubts on the validity of this instrument. Treisman (2002) finds that any relationship between corruption and fiscal decentralisation is highly sensitive to the control variables included, casting doubts on earlier studies.

Arikan (2004) analysed decentralisation measures on Transparency International's Corruption Perception Index in a cross-country dataset and found levels of corruption to be lower in decentralised countries. Lederman et al. (2005) using a panel dataset of several developed and developing countries found that the decentralisation increases corruption. Dreher (2006) finds that decentralisation is consistent with improvements in a number of key governance indicators.
Nupia (2007) use the same sample, data set, decentralisation definition, corruption index and econometric specification used by Fisman and Gatti (2002). They show that the effect that fiscal decentralisation has on corruption in developed countries cannot be confirmed in developing economies. Enikolopov and Zhuravskaya (2007) report that governance indicators improve when fiscal decentralisation is combined with strong national parties.

Fan et al. (2009), using a cross section data of 80 countries, found that reported bribery was more frequent in countries with a large number of tiers. Unlike other studies that used perception data, this study uses experiential data from the World Bank Economic Survey of bribery reported by businesspeople. However, this study has been criticised for inappropriate choice of units for comparative analysis by Ivanyina and Shah (2010), who found that decentralisation tends to reduce corruption under almost all circumstances.

Lessmann and Markwardt (2010) found that decentralisation reduces corruption where there is press freedom, but otherwise increases corruption. Kyria and Roca-Sagale’s (2011) find that fiscal decentralisation has a positive impact on the quality of government in OECD countries. Altunbas and Thornton (2012) find that decentralization has a beneficial impact on improving governance in a country by reducing corruption.

A related literature focuses on the effects of federal structure on corruption. Goldsmith (1999), Treisman (2000) and Kunicová and Rose-Ackerman (2005) all found that federal structure was associated with higher perceived corruption.

2.5 Decentralisation and Growth - Empirics

With regard to the linkage between decentralization and growth, there has been a marked inconsistency between economic theory and empirical evidence. It is widely proposed in theory that the decentralisation of power to lower level governments leads to improved economic efficiency and an increase in the growth rate at the national level (Iimi 2005). However, the existing empirical evidence does not support the
theory. Actually there is a mixed picture of the effect of decentralization on economic growth both in cross-country analyses and in studies within a single country.

Philipps and Woller (1998) undertake an empirical examination of the relationship between the level of fiscal decentralisation and economic growth rates in the period from 1974 to 1991. However, they only find a weak inverse relationship between decentralisation and growth for developed countries and find no significant relationship for developing countries. Davoodi and Zou (1998) use a cross-country panel data set of 46 developed and developing countries over the period 1970-89 to investigate whether fiscal decentralisation has any impact on growth. They find a negative relationship between decentralisation and growth for developing countries and the world, while there is no significant relationship for developed countries.

Thieben (2003) finds that there exists a “hump-shaped” relationship between economic growth and fiscal decentralisation. Countries with medium decentralisation have a slightly higher investment ratio and slightly higher growth in total factor productivity than countries with a high or a low degree of decentralisation. These studies conclude that decentralisation does generally have a positive but limited influence on growth. Martinez-Vazquez and McNab (2003) do not detect a direct relationship between fiscal decentralisation and economic growth, although they are able to establish an indirect relationship through price stability. Iimi (2005) finds that fiscal decentralisation has a significant positive impact on per capita GDP growth. Using cross-country data for the period from 1997 to 2001, it is shown that fiscal decentralisation has a significant positive impact on per capita GDP growth.

Davoodi and Zou (1998) identify a major limitation of their study is that the measure of fiscal decentralisation employed (subnational government share of total government expenditure) does not actually reflect the subnational governments’ autonomy in expenditure decision making. Similarly, Thornton (2007) indicates that a serious problem with much of the literature on the macroeconomic impact of fiscal decentralisation is that it fails to make an appropriate distinction between administrative and substantive decentralization by not recognizing that high sub-national revenue and spending shares do not necessarily indicate high local autonomy.
As such Thornton (2007) measures decentralisation only by those own revenues upon which sub-national governments have full discretion. Using this measure it is found that decentralization does not affect economic growth.

Overall, the empirical relationship between decentralisation and economic growth is also ambiguous, with studies presenting contradictory results.

3. Data

Empirical studies of the effects of decentralisation and corruption, are generally based on cross country regressions (Fan et al. 2009; Arikan 2004; Bjedov et al. 2010; Treisman 2007, 2000; Bardhan and Mokherjee 2005; Kunicová and Rose-Ackermann 2005; Fjeldstad 2003; Fisman and Gatti 2002; de Mello and Barenstein 2001; Huther and Shah 1998). For a variety of reasons, including data limitations, the time series dimension of the two link between decentralisation, corruption and growth has rarely been examined. However, averaging out data about decentralisation and corruption into a single observation for each country involves a loss of information and may distort the analysis. The availability of time series for both the indicators of corruption and of government decentralisation makes it now possible employ panel data techniques in order to avoid this problem and account for the dynamic nature of this relationship.

This chapter will investigate further the relationship between corruption, decentralisation and economic growth using panel data techniques in an attempt to see whether a robust relationship can be obtained. To conduct the analysis four categories of data are employed:

1. Corruption
2. Decentralisation
3. Economic Growth
4. A set of control variables
3.1 Corruption

A significant obstacle in the empirical analysis of corruption is the fact that, for obvious reasons, there is no directly observable indicator. As such, most empirical studies rely on some sort of subjective evaluation survey, based on the opinions of international businessmen, countries’ citizens themselves, or experts on country risk analysis.

Several different corruption measures have been exploited in the literature. Some of the most widely used are formulated by Business International, Political Risk Services, Transparency International, and the World Bank. Business International Index is based on surveys of consultants. It ranks countries according to the degree to which business transactions involve questionable payments. Political Risk Services’ International Country Risk Guide (ICRG) is based on indicators of corruption assembled by private risk-assessment firms. The Corruption Perception Index (CPI) produced by Transparency International, an NGO dedicated to fighting corruption worldwide, is an average of ratings reported by a number of surveys measuring the perceived extent of corruption. The Control of Corruption Indices (CCI) produced by the World Bank is similar to the CPI but with a broader definition of corruption and slightly different method of aggregation (Wei 1999).

For the purposes of this study we employ the International Country Risk Guide’s ‘Control of Corruption’ index (ICRG). The ICRG index measures corruption as the likelihood that government officials (both high- and low-ranking) would demand and/or accept bribes in exchange for licenses, policy protection, biased judicial sentences, avoidance of taxes and regulations, or simply to expedite government procedures. The index is based on the analysis of a worldwide network of experts. For our analysis this data set is modified so that 0 reflects low corruption while 6 reflects high corruption. While other measures of corruption are available, they do not have a time period as long as the ICRG index. However, since these other measures have been shown to be highly correlated with the ICRG index and with each other (Treisman 2000) there does not seem to be a problem in only using the ICRG index.
Lederman et al. (2006) argue that, despite their limitations, subjective indices do seem to capture the prevalence of corruption in different countries and over time. This argument is supported by the fact that the results from surveys with very different methodologies are highly correlated. It is nevertheless possible that all the methodologies share the same bias. Since opinions expressed about corruption can be influenced, for example, by the overall economic performance of a specific country, the indices could be partly capturing economic outcomes rather than corruption. Fortunately, this does not seem to be the case. The correlation between the ICRG corruption index and the growth rate of per capita GDP is very low and not statistically significant. Moreover, the quality of governance, including the absence of corruption, does not appear to improve following economic growth (Kaufman and Kraay, 2002b). In addition, the ICRG index is strongly correlated with the fraction of crimes that ends up being reported to the police (Soares 2004). This is a variable generated by individuals’ actual behaviour and, in principle, should be correlated with several dimensions of institutional development. Nevertheless, although the overall evidence suggests that the indices are reasonable measures of corruption, it is important to keep in mind their potential limitations when interpreting the results.

3.2 Decentralisation

Accurately capturing the extent of decentralisation also presents significant problems. To measure decentralisation, we make use of the International Monetary Fund’s (IMF) Government Finance Statistics (GFS) as described in Dziobek et al. (2011). From here we obtain three measures of fiscal decentralisation: subnational (state plus local) share of total government revenue (Dec1), subnational share of total government expenditure (Dec2) and the share of subnational expenditure financed by own source revenues (Dec3).

The most widely used measures of decentralisation are the first of these two indicators – the subnational governments’ share of total government revenue/expenditure. However, while the these two indicators have long been popular in empirical studies of decentralisation (see e.g., Fisman and Gatti 2002), it has been argued that they are
flawed in the sense that they fail to recognize that high subnational revenue and spending shares do not necessarily indicate high local autonomy (Ebel and Yilmaz 2002). Thus, expenditures that are mandated by the central government appear as sub-national expenditures in the GFS while revenues received from grants by the central government appear as sub-central revenues regardless of whether they are conditional or unconditional. As a result, expenditure and revenue accruing to sub-central levels of government will tend to overestimate the degree of fiscal decentralization.

Joumard and Kongsrud (2003) and Darby et al. (2003) show that limits on the discretion of subnational governments to determine tax rates and tax bases significantly reduce local fiscal autonomy. Thornton (2007) argues that empirical estimates that fail to take account of the degree of local autonomy can give misleading results.

Despite their shortcoming, these indicators are available for the widest coverage of countries and time periods and it is for this reason that we employ them in this paper. Nevertheless, in an attempt to overcome the problems associated with the first two measures we also employ a third measure of decentralisation – the revenue autonomy variable. This measure attempts to capture how much autonomy subnational governments have over their revenue. However it should be noted that this variable, as with all other potential measures, suffer from even more limited cross-section and temporal availability.

3.3 Economic Growth and Baseline Controls

To measure economic growth we use growth in per capita GDP (PPP, constant 2005 US$) from the World Bank. We also include several other indicators that are

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17 The GFS also contain data on other fiscal decentralization variables but with an even more limited cross-section and temporal availability. One line of data refers to vertical imbalance (VIM) or the degree to which sub-national governments rely on central government transfers to support their expenditures (measured as intergovernmental transfers as a share of sub-national expenditures). Another calculates transfers share as transfers to sub-central governments as a share of total sub-national revenues and grants (Trashare). However, these measures do not distinguish what proportion of transfers is conditional versus general purpose.
commonly used in growth regressions (for example Barro 1991; Levine and Renelt 1992; Sachs and Warner 1995): initial GDP per capita (PPP, constant 2005 US$), Investment (% GDP), Inflation (GDP Deflator %), Secondary School Enrolment Rate (% of people aged 15 and above), Population Growth Rate (%), FDI inflow (% GDP), Trade (% GDP). All these data come from the World Bank.

3.4 Summary Statistics and Correlations

We construct 6 non-overlapping 5-year period averages (1981-85, 1986-90, ..., 2006-10) in order to minimise business cycle effects. With a sample size of 60 countries this implies a maximum potential number of observations of 360. However, missing data means working with a panel of smaller size. Summary statistics and correlations for key variables are presented in Tables 1 & 2.

- The main points to note are the substantial cross-country variation in the summary statistics (Table 1), including in the fiscal decentralization indicators, with the measures of decentralisation ranging from 0 to 98.8.
- The correlation coefficients are relatively low (Table 2), except between Dec1 and Dec2.

Table 1. Summary Statistics for Key Variables.

<table>
<thead>
<tr>
<th>Key Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corruption (ICRG)</td>
<td>328</td>
<td>2.237195</td>
<td>1.445573</td>
<td>0</td>
<td>5.9</td>
</tr>
<tr>
<td>Dec1 (Rev)</td>
<td>206</td>
<td>27.31845</td>
<td>15.85238</td>
<td>0.9</td>
<td>88.5</td>
</tr>
<tr>
<td>Dec2 (Exp)</td>
<td>205</td>
<td>24.29366</td>
<td>16.25028</td>
<td>2.2</td>
<td>98.6</td>
</tr>
<tr>
<td>Dec3 (OR)</td>
<td>182</td>
<td>66.1489</td>
<td>24.01679</td>
<td>2.1</td>
<td>98.8</td>
</tr>
</tbody>
</table>
Table 2. Correlation Coefficients for Key Variables.

<table>
<thead>
<tr>
<th>Key Variable</th>
<th>Growth (GDPpc)</th>
<th>Corruption (ICRG)</th>
<th>Dec1 (Rev)</th>
<th>Dec2 (Exp)</th>
<th>Dec3 (OR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth (GDPpc)</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corruption (ICRG)</td>
<td>0.3892</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec1 (Rev)</td>
<td>-0.1469</td>
<td>-0.2841</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec2 (Exp)</td>
<td>-0.0992</td>
<td>-0.2886</td>
<td>0.9573</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>Dec3 (OR)</td>
<td>-0.0685</td>
<td>-0.0594</td>
<td>0.2722</td>
<td>0.2103</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

An initial assessment of the relationship between corruption and growth is given in the first cross-country scatter plot in Figure 1. Here we see a slight positive correlation. This perhaps surprising result is likely due to that fact that many high corruption countries are often poorer which means they have large ‘catch up’ potential (for example China, India etc.). Controlling for per capita GDP should account for at least part of this result.

Figure 1. Corruption-Growth Scatter Plot.

Figure 2 displays cross-country scatter plot of the rate of growth against the extent of decentralisation. As expected, no clear relationship is visible.
Figure 2. Decentralisation-Growth Scatter Plot.

Figure 3 displays cross-country scatter plot of decentralisation against the GDP per capita. A positive correlation is evident showing that on average higher income countries are more decentralised.

Figure 3. Income-Decentralisation Scatter Plot.

Figure 4 displays cross-country scatter plot of corruption against the GDP per capita. A clear negative correlation is evident showing that on average lower income countries are more corrupt.
4. Estimation and Methodology

The main aim of this chapter is to analyse empirically the relationship between decentralisation, corruption and economic growth. While several papers have looked at the relationship between corruption and growth and quite a few have looked into corruption and decentralisation, with a small number looking into decentralisation and growth, few have analysed the joint relationship between corruption, decentralisation and economic growth. Moreover we use a more up to date data set and we employ both Fixed Effects (FE) and Generalised Method Moments (GMM) estimators, something that is lacking in much the previous research in this area. The advantage of GMM is that it alleviates the endogeneity problems that others studies of this kind suffer from. In particular, the possibility that the fiscal and corruption variables may be influenced by growth.

To begin with a series of regressions were undertaken using the following specification:

\[
g_{i,t} = \alpha + \beta_1 Cor_{i,t} + \beta_2 Dec_{i,t} + \Sigma_{j=1}^{m} Y_{j, it} + \delta_t + \mu_i + \varepsilon_{i,t}
\]
We also run a set of regressions in which we include an interaction term between the corruption variable and the decentralisation variable:

\[(2) \quad g_{i,t} = \alpha + \beta_1 Cor_{i,t} + \beta_2 Dec_{i,t} + \beta_3 (Cor \times Dec)_{i,t} + \sum_{j=1}^{m} \gamma_j X_{j,it} + \delta_t + \mu_i + \varepsilon_{i,t}\]

Where

- \(g_{i,t}\) is the growth rate of real per capita GDP of country \(i\) in year \(t\);
- \(Cor_{i,t}\) is a measure of corruption;
- \(Dec_{i,t}\) is a measure of decentralisation;
- \((Cor \times Dec)_{i,t}\) is the interaction term between corruption and decentralisation;
- \(\{X_{j,it}\}\) is a set of explanatory variables
- \(\delta_t\) is a vector of common time-varying effects
- \(\mu_i\) captures unobserved time-invariant country-specific effects; and
- \(\varepsilon_{i,t}\) is the time-varying error term.

By including both a measure of corruption and a measure of decentralisation separately, and also including an interaction term between the two, we can study the effect of two terms independently but also jointly.

- If, as we expect, \(\beta_1\) is negative it shows that corruption does indeed have a negative effect on economic growth.
- If \(\beta_2\) is positive (negative) it suggests that decentralisation has a positive (negative) effect on economic growth.
- If \(\beta_3\) is positive (negative) it suggests that the negative effect of corruption on economic growth is reduced (increased) by decentralisation.

The first specification is a standard fixed effects (FE) estimator that is frequently used in the literature. We use cross section fixed effects with heteroskedastic-consistent standard errors. This is also called the Parks estimator (Wooldridge 2002). The fixed effect estimator has the advantage that it controls for country-specific time-invariant factors that may affect growth.
Bringing fixed effects estimation to bear on the relationship between fiscal decentralization and government quality has an important advantage over previous cross-section estimations exploring this relationship namely, the ability to control for cross-country heterogeneity due to time constant (or slowly changing) observable or unobserved factors (cross-section fixed effects) as well as the ability to control for period-specific factors common to all cross-section units (period fixed effects). Given non-observable variables may be related to decentralisation, corruption and economic growth, their exclusion would induce omitted variable bias, affecting both the estimated impact of decentralisation and its statistical significance. Bardhan and Mookherjee (2006) identify this form of bias as one of the important methodological problems with existing cross-section studies estimating the effect of decentralisation on governance. Our fixed effect estimation then reduces the likelihood of omitted variable bias since it eliminates the possible influence coming from time constant variables\(^\text{18}\).

The second specification is Generalised Method of Moments (GMM). It is a technique that has so far not been used in studies of this kind. The System GMM estimator developed by Arellano and Bover (1995) allows the use of internal instruments. As a result it solves a number of issues arising in the data: the presence of country fixed effects, the endogeneity of the right hand side regressors, and the existence of simultaneity bias. It achieves this by combining an equation in first-differences with one in levels. In the former, the first-differences of the endogenous variables are instrumented by their own lagged levels. In the latter, lagged values of the first-differences are used as instruments, under the assumption that the regressors’ first-differences are orthogonal to the individual fixed effects (Blundell and Bond 1998).

In our case, this amounts to assuming that there is no systematic relationship between a country’s fixed effect and its distance from the conditional long-run mean of

\(^{18}\) The use of random effects estimation would not allow us to deal with omitted variable bias in a similarly satisfactory manner. Moreover, since our cross-section units are not exchangeable, it is not appropriate to treat our sample as if it were a random sample from a large population as would be implied by the use of random effects estimation (Hsiao 2003).
all the right hand side instrumenting variables. As recommended by Roodman (2009), we test for the quality of the instrument subset using the difference-in-Hansen test.

The System-GMM approach is preferred to the Difference-GMM (Arellano and Bond, 1991), because the latter solves the endogeneity problem by instrumenting the differenced endogenous variables with their available lags in levels. However, lagged levels are weak instruments for first-differences if the series are very persistent (Blundell and Bond, 1998), which is most likely the case for institutional variables, such as the decentralisation measures employed in this analysis.

Under an additional set of assumptions, the System-GMM estimator can overcome these problems and increase efficiency. To be more specific, if the assumption that the regressors’ first-differences are not correlated with the country effects holds, lagged values of the first-differences can be used as instruments in the equation in levels. The estimation will then combine the set of moment conditions available for the first-differenced equation with the additional moment conditions available for the level equation. To avoid dynamic panel bias, we instrument for all variables which are not strictly exogenous. These include all the right hand side variables in all the robustness regression specifications. In this respect, Hayakawa (2007) shows that the System-GMM estimator is less biased than the Difference-GMM, even though the latter uses more instruments.

The instrumenting variables include all those which are not strictly exogenous, that is, all the right hand side variables. However, while it is true that more instruments convey additional useful information, too many instruments can result in the over-fitting of the instrumented variables, thereby biasing the results towards those obtained by OLS. As a consequence, we follow Roodman (2009) and present results with a collapsed instrument matrix.\textsuperscript{19} In addition, each regression is estimated with the instrument lag interval that considers the trade-off between the total number of instruments and the resulting degree of over-identification. Given there are seven

\textsuperscript{19} Collapsing the instrument matrix amounts to creating only one instrument for each variable and lag distance, rather than one for each time period, variable, and lag distance. This reduces instrument proliferation.
time periods in the data set, the maximum number of lags is five. To avoid issues of over-identification we employ a lag interval of 2-4.

Finally, two specification tests are used to confirm the validity of the instrumentation strategy. These are the Hansen (1982) J-test of over-identifying restrictions, assessing the exogeneity of the excluded instruments; and the Arellano and Bond (1991) test, which is informative of the presence of serial correlation in the error term.

The Hansen (1982) J-test examines the exogeneity of the instruments. This test is consistent in the presence of both heteroscedasticity and autocorrelation of any pattern. Failure of the null hypothesis suggests that the instruments are endogenous. The Arellano and Bond (1991) test for serial correlation, the existence of which can cause a bias to both the estimated coefficients and standard errors. We apply this test to all of our instrumental variable regressions. Since the system-GMM strategy of first-differencing induces first-order serial correlation in the transformed errors, the appropriate check in this case relates only to the absence of second-order serial correlation.

5. Results

Results for fixed effects regressions are presented in Tables 3-5. Table 3 presents the results when the first measure of decentralisation is included (Dec1), which corresponds to the revenue share of subnational governments. Here we see that corruption does indeed have a negative effect on growth. The effect of this decentralisation measure is insignificant. When the interaction term is included it is insignificant. Table 4 reports results when fixed effects are used together with expenditure decentralisation (Dec2). Results are very similar to that for Dec1. This is not surprising since Dec1 and Dec2 are highly correlated. Once again we see that corruption has a negative effect on growth. The effect of decentralisation is still insignificant as is the interaction term. Table 5 reports results when fixed effects are used together with Dec3. Here we again see that corruption has a negative effect on growth. The decentralisation variable is positive but only significant for two of the
regressions undertaken. Once again the interaction term is insignificant. Results are for all three cases are sensitive to the control variables used.

Overall, the results from the Fixed Effects estimations point towards a significant negative effect of corruption on economic growth, albeit one that is sensitive to the control variables employed. This result is line with much of the previous literature where it is generally found that corruption has a negative effect on economic growth (e.g., Mauro 1995; 1997; Tanzi and Davoodi 1997; Wei 1999; 2000; Mo 2001; Pelligrini and Gerlagh 2004). The results of decentralisation are, however, largely insignificant. That no significant relationship is found between decentralisation and growth is in line with previous empirical research such as Martinez-Vazquez (2004) and Thornton (2007). However it casts doubt on some earlier studies who claim to show a positive relationship between corruption and growth (Davoodi and Zou 1998; limi 2005; Thieben 2003).
Table 3. Fixed Effects - Revenue Decentralisation, Corruption and Growth.

<table>
<thead>
<tr>
<th></th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
<th>Column 5</th>
<th>Column 6</th>
<th>Column 7</th>
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</thead>
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<tr>
<td>Dec1</td>
<td>-0.032</td>
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<td>-0.004</td>
<td>-0.004</td>
<td>-0.016</td>
<td>-0.031</td>
<td>-0.021</td>
</tr>
<tr>
<td></td>
<td>(0.036)</td>
<td>(0.035)</td>
<td>(0.030)</td>
<td>(0.321)</td>
<td>(0.035)</td>
<td>(0.034)</td>
<td>(0.060)</td>
</tr>
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<td>-0.641</td>
<td>-0.619</td>
<td>-0.654</td>
<td>-0.664</td>
<td>-0.500</td>
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</tr>
<tr>
<td></td>
<td>(0.307)</td>
<td>(0.362)*</td>
<td>(0.332)*</td>
<td>(0.320)**</td>
<td>(0.350)*</td>
<td>(0.296)*</td>
<td>(0.429)</td>
</tr>
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<td>Corr*Dec1</td>
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<td></td>
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</tr>
<tr>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>(1.313)***</td>
<td>(1.437)***</td>
<td>(1.456)***</td>
<td>(1.448)***</td>
<td>(1.422)***</td>
<td>(1.245)***</td>
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<td>(0.056)*</td>
<td>(0.087)</td>
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<td>Infl.</td>
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<td>-0.011</td>
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<tr>
<td></td>
<td>(0.005)*</td>
<td>(0.004)**</td>
<td>(0.005)**</td>
<td>(0.005)**</td>
<td>(0.005)**</td>
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<td>Pop</td>
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<tr>
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<td>(0.501)*</td>
<td>(0.417)**</td>
<td>(0.433)**</td>
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<td>(0.528)*</td>
<td>(0.444)**</td>
</tr>
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<td>M2</td>
<td>-</td>
<td>-0.032</td>
<td>-0.032</td>
<td>-0.035</td>
<td>-0.034</td>
<td>-</td>
<td>-0.029</td>
</tr>
<tr>
<td></td>
<td>(0.012)***</td>
<td>(0.013)**</td>
<td>(0.014)**</td>
<td>(0.012)***</td>
<td></td>
<td></td>
<td>(0.015)*</td>
</tr>
<tr>
<td>FDI</td>
<td>-</td>
<td>-</td>
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<td></td>
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<td>(0.111)*</td>
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<td>$N$</td>
<td>159</td>
<td>145</td>
<td>144</td>
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<td>145</td>
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Heteroskedastic-robust standard errors in parenthesis (*p<0.1, **p<0.05; ***p<0.01).
<table>
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<th>(1)</th>
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<tr>
<td><strong>Dec2</strong></td>
<td>0.0013</td>
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<td>0.008</td>
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<td>(0.015)</td>
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<td></td>
<td>(0.298)</td>
<td>(0.343)*</td>
<td>(0.308)*</td>
<td>(0.287)**</td>
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<td>(0.286)</td>
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Heteroskedastic-robust standard errors in parenthesis (*p<0.1,* *p<0.05; ***p<0.01).
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Heteroskedastic-robust standard errors in parenthesis (*p<0.1, * *p<0.05; ***p<0.01).

We now go on to discuss the estimations from the GMM regressions. Results for GMM regressions are presented in Tables 6-8. For all regressions the Hansen test statistic was insignificant meaning that we can reject the null hypothesis of endogenous instruments. Similarly, the results from the Arellano Bond (1991) test show that there is no serial correlation in the second lag of the errors. As such the results reported are free from endogeneity and serial correlation. Heteroskedastic standard errors are also used to avoid any problems in this regard.
Table 6 presents the results when the first measure of decentralisation is included (Dec1), which corresponds to the revenue share of subnational governments. Corruption is negative but largely insignificant while the decentralisation term is positive but largely insignificant. Table 7 reports results when GMM are used together with the second decentralisation measure (Dec2), which captures the expenditure share of subnational governments. Results are very similar to that for Dec1. Once again we see that corruption has a negative but largely insignificant effect on growth. The effect of decentralisation is again positive but insignificant. Table 8 reports results when GMM are used together with Dec3. Here we again see that corruption has a negative but largely insignificant effect on growth. The decentralisation variable is also insignificant. In all three cases the interaction term is insignificant.

Overall, the results from the GMM estimations point towards a negative effect of corruption on economic growth. This is in line with much of the literature. However, when GMM is employed, this relationship is largely insignificant. The could be due to the nature of the GMM technique combined with a relatively small sample (see below), alternatively it could be seen to cast doubt on previous studies of this kind. Ours is not the first study to question the reliability of the corruption-growth relationship at the macroeconomic level (Aidt 2009; Svensson 2005), and it may be the case that once endogeneity problems are accounted for there is no robust relationship.

The results of GMM point towards a positive relationship between decentralisation and growth, although again this result is largely insignificant. This result is in line with much of the previous research where it is often claimed that decentralisation will have a beneficial impact on economic performance (see e.g., Kolstad and Fjelstad (2006), but that this relationship is not found to be significant in the data (Thornton 2007).

The results in tables 6-8 are largely insignificant. This is often the case when using GMM in studies of this kind. The GMM estimator is highly desirable due to its ability to overcome endogeneity problems. However, they have been developed for panels that have much larger cross sections than ours, which perhaps helps explain the sensitivity of the results of our analysis. Due to data limitations, when analysing the effects of
decentralisation the sample size becomes very small and this could explain why results are not found to be significant.

Table 6. GMM - Revenue Decentralisation, Corruption and Economic Growth.

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Heteroskedastic-robust standard errors in parenthesis (*p<0.1; **p<0.05; ***p<0.01).
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</tr>
<tr>
<td><strong>AB AR(1)</strong></td>
<td>(0.452)</td>
<td>(0.605)</td>
<td>(0.046)</td>
<td>(0.027)</td>
<td>(0.013)</td>
<td>(0.014)</td>
<td>(0.022)</td>
</tr>
<tr>
<td><strong>AB AR(2)</strong></td>
<td>(0.218)</td>
<td>(0.183)</td>
<td>(0.863)</td>
<td>(0.343)</td>
<td>(0.260)</td>
<td>(0.266)</td>
<td>(0.402)</td>
</tr>
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*Heteroskedastic-robust standard errors in parenthesis (*p<0.1; *p<0.05; ***p<0.01).*
Table 8. GMM - Decentralisation (revenue autonomy), Corruption and Growth.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
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<td>0.006</td>
<td>-0.004</td>
<td>-0.008</td>
<td>0.007</td>
<td>-0.041</td>
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<tr>
<td></td>
<td>(0.048)</td>
<td>(0.032)</td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.022)</td>
<td>(0.021)</td>
<td>(0.085)</td>
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<tr>
<td><strong>Corrupt</strong></td>
<td>-1.285</td>
<td>-1.065</td>
<td>-0.487</td>
<td>-0.437</td>
<td>-0.325</td>
<td>-0.347</td>
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<td></td>
<td>(2.338)</td>
<td>(1.819)</td>
<td>(0.868)</td>
<td>(0.969)</td>
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<td>(0.669)</td>
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<tr>
<td><strong>Cor*Dec3</strong></td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<td></td>
<td></td>
<td></td>
<td>(0.033)</td>
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<tr>
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<td>-0.004</td>
<td>-0.005</td>
<td>-0.005</td>
<td>-0.004</td>
<td>-0.006</td>
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<td>(0.020)</td>
<td>(0.011)</td>
<td>(0.012)</td>
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<td><strong>Infl.</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>school</strong></td>
<td>0.146</td>
<td>0.150</td>
<td>0.115</td>
<td>0.133</td>
<td>0.119</td>
<td>0.119</td>
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<tr>
<td></td>
<td>(0.095)</td>
<td>(0.069)</td>
<td>(0.049)</td>
<td>(0.065)</td>
<td>(0.049)</td>
<td>(0.047)</td>
<td>(0.062)</td>
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<td><strong>trade</strong></td>
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<td>0.022</td>
<td>0.013</td>
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<td>-</td>
<td>-</td>
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<td></td>
<td>(0.078)</td>
<td>(0.045)</td>
<td>(0.020)</td>
<td>(0.025)</td>
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<tr>
<td><strong>pop</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.596</td>
</tr>
<tr>
<td></td>
<td>(0.973)</td>
<td>(0.633)</td>
<td>(0.693)</td>
<td>(0.615)</td>
<td>(0.607)</td>
<td>(0.603)</td>
<td></td>
</tr>
<tr>
<td><strong>M2</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.041</td>
</tr>
<tr>
<td></td>
<td>(0.018)</td>
<td>(0.020)</td>
<td>(0.021)</td>
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<td>(0.027)</td>
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<tr>
<td><strong>FDI</strong></td>
<td>-</td>
<td>-</td>
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<td>0.167</td>
<td>0.105</td>
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<td></td>
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<td></td>
<td>(0.187)</td>
<td>(0.180)</td>
<td></td>
<td>(0.204)</td>
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<tr>
<td><strong>Obs.</strong></td>
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<td>148</td>
<td>134</td>
<td>133</td>
<td>133</td>
<td>134</td>
<td>133</td>
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<tr>
<td><strong>Groups</strong></td>
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<td>56</td>
<td>55</td>
<td>54</td>
<td>54</td>
<td>55</td>
<td>54</td>
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<tr>
<td><strong>Instr.</strong></td>
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<td>37</td>
<td>41</td>
<td>45</td>
<td>45</td>
<td>41</td>
<td>49</td>
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<tr>
<td><strong>Hansen</strong></td>
<td>(0.200)</td>
<td>(0.191)</td>
<td>(0.725)</td>
<td>(0.806)</td>
<td>(0.499)</td>
<td>(0.630)</td>
<td>(0.522)</td>
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<tr>
<td><strong>AB AR(1)</strong></td>
<td>(0.496)</td>
<td>(0.152)</td>
<td>(0.044)</td>
<td>(0.042)</td>
<td>(0.034)</td>
<td>(0.037)</td>
<td>(0.047)</td>
</tr>
<tr>
<td><strong>AB AR(2)</strong></td>
<td>(0.964)</td>
<td>(0.624)</td>
<td>(0.239)</td>
<td>(0.201)</td>
<td>(0.226)</td>
<td>(0.219)</td>
<td>(0.229)</td>
</tr>
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</table>

Heteroskedastic-robust standard errors in brackets (*p<0.1; *p<0.05; *** p<0.01).
6 Conclusion

This chapter has analysed the relationship between corruption, decentralisation and economic growth using panel data techniques. It was found that there is evidence of a negative effect of corruption on economic growth, which is in line with most of the previous literature. However, this result was not significant when GMM was employed. This could be down to data limitations or it could be seen to cast doubt on earlier studies. The effect of decentralisation on growth is even more ambiguous. There are signs of a slight positive relationship but it is very sensitive to the controls used. When we employed an interaction term between corruption and decentralisation it was not significant in any of the regressions.

This chapter highlights how difficult it is to obtain a clear cut relationship regarding the effects of decentralisation. There are two main reasons for this. Firstly, given the complex nature of decentralisation, as well as the varying conditions it is implemented in, a clear relationship should not necessarily be expected. Secondly, given the inherent difficulties in measuring a complex phenomenon such as decentralisation, and the pronounced data problems in developing countries, a reliable relationship will be hard to identify even if it does exist.

This in line with Treisman (2007), who suggested that the effect of decentralisation on the reduction of corruption was not robust, and Asthana (2013) who doubts whether more and more complex quantitative methods will be able to breach the wall of uncertainty relating to the effect of decentralisation.

Thus we are forced to accept that the overall effect of decentralisation on both corruption and economic growth remains ambiguous. Indeed, due to the complex, multi-faceted nature of both subjects it there appears to be a variety of effects operating simultaneously, with the overall result depending upon a whole host of factors. In order to determine whether decentralisation can be a useful institutional reform, further research is necessary.
### Appendix A: Country and Data Summary Tables

#### Table A1. Country List

Albania, Argentina, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bolivia, Brazil, Bulgaria, Canada, Chile, China, Congo, Costa Rica, Croatia, Czech Rep., Denmark, Dominica, Estonia, Ethiopia, Finland, France, Germany, Greece, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Latvia, Lithuania, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Paraguay, Poland, Portugal, Romania, Russia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Thailand, Uganda, Ukraine, United Kingdom, United States.

#### Table A2. Summary Statistics

<table>
<thead>
<tr>
<th></th>
<th>Obs.</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec1 (revenue)</td>
<td>207</td>
<td>27.38</td>
<td>15.84</td>
<td>0.9</td>
<td>88.5</td>
</tr>
<tr>
<td>Dec2 (expenditure)</td>
<td>206</td>
<td>24.33</td>
<td>16.22</td>
<td>2.2</td>
<td>98.6</td>
</tr>
<tr>
<td>Dec3 (autonomy)</td>
<td>183</td>
<td>66.13</td>
<td>23.95</td>
<td>0.5</td>
<td>98.8</td>
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<tr>
<td>Corruption</td>
<td>328</td>
<td>2.24</td>
<td>1.44</td>
<td>0</td>
<td>5.9</td>
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<tr>
<td>Economic Growth (%)</td>
<td>346</td>
<td>3.08</td>
<td>3.59</td>
<td>-15.58</td>
<td>16.93</td>
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<tr>
<td>GDP per capita</td>
<td>355</td>
<td>15,919.34</td>
<td>11,843.33</td>
<td>470.33</td>
<td>70,995.1</td>
</tr>
<tr>
<td>Investment (%GDP)</td>
<td>352</td>
<td>22.61</td>
<td>5.29</td>
<td>8.64</td>
<td>44.35</td>
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<td>Inflation (%)</td>
<td>346</td>
<td>50.82</td>
<td>226.215</td>
<td>-3.21</td>
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<tr>
<td>School Enrolment Rate</td>
<td>347</td>
<td>86.25</td>
<td>25.43</td>
<td>6.78</td>
<td>155.37</td>
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<tr>
<td>Population growth (%)</td>
<td>366</td>
<td>0.89</td>
<td>0.9975</td>
<td>-1.90</td>
<td>3.71</td>
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<tr>
<td>Trade (%GDP)</td>
<td>349</td>
<td>74.86</td>
<td>41.45</td>
<td>13.95</td>
<td>307.058</td>
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<tr>
<td>M2 (%GDP)</td>
<td>312</td>
<td>63.08</td>
<td>61.096</td>
<td>7.89</td>
<td>605.17</td>
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<tr>
<td>FDI Inflow (%GDP)</td>
<td>331</td>
<td>6.01</td>
<td>30.322</td>
<td>-2.99</td>
<td>362.04</td>
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</table>
Table A2. Data Sources

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec1 (revenue)</td>
<td>Subnational (state plus local) government revenue as a percentage of total government revenue.</td>
<td>International Monetary Fund, GFS</td>
</tr>
<tr>
<td>Dec2 (expenditure)</td>
<td>Subnational (state plus local) government expenditure as a percentage of total government expenditure.</td>
<td>International Monetary Fund, GFS</td>
</tr>
<tr>
<td>Dec3 (revenue autonomy)</td>
<td>The percentage of subnational revenue that subnational governments have autonomy over.</td>
<td>International Monetary Fund, GFS</td>
</tr>
<tr>
<td>Corruption</td>
<td>International Country Risk Guide’s control of corruption index (modified so that higher numbers reflect higher corruption)</td>
<td>International Country Risk Guide</td>
</tr>
<tr>
<td>Economic Growth (%)</td>
<td>Percentage change in per-capita GDP</td>
<td>World Bank, WDI</td>
</tr>
<tr>
<td>Log GDP per capita</td>
<td>The logarithm of GDP per capita in constant 2000 US$ in log form.</td>
<td>World Bank, WDI</td>
</tr>
<tr>
<td>Investment (%GDP)</td>
<td>Gross Capital Formation as a percentage of GDP.</td>
<td>World Bank, WDI</td>
</tr>
<tr>
<td>Inflation (%)</td>
<td>GDP Deflator.</td>
<td>World Bank, WDI</td>
</tr>
<tr>
<td>School Enrolment Rate</td>
<td>The stock of patents for country i is calculated using the perpetual inventory procedure in line:</td>
<td>World Bank, WDI</td>
</tr>
<tr>
<td>Population growth (%)</td>
<td>Growth rate of population.</td>
<td>World Bank, WDI</td>
</tr>
<tr>
<td>Trade</td>
<td>Sum of a country’s exports and imports (% of GDP).</td>
<td>World Bank, WDI</td>
</tr>
<tr>
<td>M2 (%GDP)</td>
<td>Value of listed shares to GDP, calculated using the deflation:</td>
<td>World Bank, WDI</td>
</tr>
<tr>
<td>FDI Inflow (%GDP)</td>
<td>Net inflows of Foreign Direct Investment (% of GDP).</td>
<td>World Bank, WDI</td>
</tr>
</tbody>
</table>
CONCLUSIONS

This thesis investigates the relationship between decentralisation, corruption and economic growth from a macroeconomic perspective. This was done both theoretically and empirically. The thesis highlights the complex nature of this relationship, with no overall relationship established either theoretically or empirically. Indeed it is argued that the results of decentralisation will depend on the design and implementation of reforms and on the wider institutional environment.

Chapter one analysed the effects of decentralisation by comparing and contrasting the macroeconomic implications of corruption in alternative bureaucratic structures using a dynamic equilibrium model of economic growth through capital accumulation. It was argued that, since local government officials are considered to be better informed about the needs of the local community, they may also be in a better position to recognise the effects of their corrupt behaviour on economic outcomes within their jurisdiction. This feature occurs endogenously in this model since, in a decentralised system, government officials are able to internalise the negative externalities caused by their illicit behaviour. As result they have an incentive to limit their corrupt bribe demands. This in turn leads to a more favourable investment climate in which entrepreneurs are encouraged to investment in more productive technologies, which ultimately leads to a higher growth rate in the economy. Although some authors have mentioned the possibility of this result, this analysis represents the first formal macroeconomic model with this feature, and in some respects represents a reverse of the conclusions of many previous studies. Since the publication of Shleifer and Vishny (1993) it has become common to associate decentralisation with a more disorganised rent-seeking environment which is more harmful to economic activity. However here it is shown that, as long as reforms are carefully designed, decentralisation can have the opposite effect, generating outcomes that are in fact identical to those of organised corruption. It must be stressed, however, that much depends on the establishment of a clear division of functions, authority and responsibility in order to avoid overlapping jurisdictions and the ensuing confusion.

Another implication of this analysis is that, in developing countries where corruption may be endemic and capacity is lacking at lower levels of government, even limited forms of decentralisation (administrative deconcentration) can have positive effects on reducing the level of corruption on increasing economic growth. These results arise
without appealing to the disciplining effects of interjurisdictional competition or improved democratic accountability (both of which may be missing in developing countries). Limited forms of decentralisation such as this can be an important stepping stone towards more extensive reforms, but only if they are successful. The results provide additional insight into the complex, multifaceted issue of decentralisation and corruption.

Chapter two highlights one of the potential the trade-offs involved when a country undertakes a more extensive form of decentralisation (closer to fiscal delegation). It shows how decentralisation may have both positive and negative effects on economic performance through two distinct channels: on the one hand, by bringing the government closer to the people and improving access to local information, decentralisation can foster more productive investment choices; on the other hand, by weakening the accountability and transparency of bureaucratic behaviour, decentralisation can foster counter-productive corrupt practices. For decentralisation to be successful it is essential to ensure effective accountability mechanisms are in place at the local level. Building an accountability system that will work post-decentralisation will depend on ensuring reforms are carefully designed to include measures to increase transparency, participation and accountability to citizens at the local level. This presents a significant challenge. Local governments may lack capacity, local media may be ineffective, local elites may be too powerful and local elections may be flawed. It will be necessary for both national and local governments to invest significantly in building effective accountability mechanisms that will include active citizen participation. Before such events transpire, one might see an initial period where decentralisation does little or nothing (or even worse) to improve outcomes as corruption takes place at the local level unabated.

Chapter three of this thesis analysed the relationship between decentralisation, corruption and economic growth empirically using panel data techniques. It was found that there is evidence of a negative effect of corruption on economic growth, which is in line with most of the previous literature. However, when the Generalised Method of Moments approach was applied this relationship was mostly insignificant. This result casts doubt on the robustness of the corruption-growth relationship found in many other studies. The effect of decentralisation on growth is even more
ambiguous. There are signs of a slight positive relationship but it is very sensitive to the controls used. When we employed an interaction term between corruption and decentralisation it was not significant in any of the regressions. This chapter highlights how difficult it is to obtain a clear cut relationship regarding the effects of decentralisation. There are two main reasons for this. Firstly, given the complex nature of decentralisation, as well as the varying conditions it is implemented in, a clear relationship should not necessarily be expected. Secondly, given the inherent difficulties in measuring a complex phenomenon such as decentralisation, and the pronounced data problems in developing countries, a reliable relationship will be hard to identify even if it does exist. Thus we are forced to accept that the overall effect of decentralisation on both corruption and economic growth remains ambiguous. Indeed, due to the complex, multi-faceted nature of both subjects it there appears to be a variety of effects operating simultaneously, with the overall result depending upon a whole host of factors.

Overall this thesis argues that if undertaken carefully, decentralisation can be an effective way to reduce corruption and improve economic outcomes, but this result is by no means certain. Firstly, it is vital to establish of a clear division of functions, authority and responsibility in order to avoid overlapping jurisdictions and the ensuing confusion. Secondly, reforms must include specific plans to introduce accountability mechanisms at the local level. Importantly, it may take time for the positive effective is decentralisation to outweigh the negative effects and so an initially period where outcome deteriorate may be expected. In such cases there may be pressures to re-centralise. However, it is argued that in such cases greater effort should be made on ensuring effective accountability mechanisms are in place at the local level, which will require continuous effort over a sustained period.
BIBLIOGRAPHY


Azis, I.J. (2002) What would have happened in Indonesia if different Economic Policies had been implemented when the Crisis Started? The Asian Economic Papers, vol. 1 no. 2.


