

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

CORRUPTION, GOVERNANCE, AND POVERTY IN SUB-
SAHARAN AFRICA: PANEL EVIDENCE

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Acronyms

ADI = Africa Development Indicators

CPI = Corruption Perception Index

DIFF-GMM = Difference Generalized Method of Moments

GDPPCGR = Gross Domestic Product per capita Growth rate

GE = Government Effectiveness

GN = Gender

GMM = Generalized Method of Moment

GQ = Governance Quality

HDR = Human Development Report

HPI = Human Poverty Index

INF = Inflation

MDGs = Millennium Development Goals

OECD = Organization for Economic Co-operation and Development

ODI = Overseas Development Institute

PSV = Political Stability and Absence of Violence

RL = Rule of Law

RP = Rural Population

RQ = Regulatory Quality

SSA = Sub-Saharan Africa

SYS-GMM = System Generalized Method of Moments

UNDP = United Nations Development Program

USAID = United States Agency for International Development

VA = Voice and Accountability

WDI = World Development Indicator

Abstract

This paper examines the relationship between corruption and poverty as well as their causal links. The effects of governance on both corruption and poverty are also addressed in the study. Data for 23 sub-Saharan African countries over the years 2000 – 2009 are used in a dynamic panel model of System-Generalized Method Moment estimation. Results show that corruption significantly and positively affects poverty indicating increased corruption increases poverty and vice versa. Capability poverty measured by Human Poverty Index also affects corruption, showing the same sign of effect. The causal link between corruption and poverty is found to be bidirectional running both from corruption to poverty and from poverty to corruption. That is, current and past information on corruption helps to improve the prediction on poverty as well as current and past information on poverty helps to improve the prediction on corruption. Governance quality affects poverty where improved governance contributes to poverty reduction and poor governance increases poverty. Each of the governance indicators: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, and rule of law are also found to affect corruption level when considered independently. It is, therefore, important to understand corruption-poverty nexus while developing and implementing development policies. Policies of combating corruption and alleviating poverty should be an integral component of the same strategy and not be treated separately.

Key words: *Corruption, Poverty, Governance Quality, Governance indicators, Generalized Method of Moment, Voice and Accountability, Political Stability and absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law.*

CHAPTER ONE

Introduction

This section provides the basic grounds for conducting the study including the nature, past phenomenon, and the linkages regarding corruption, poverty, and governance. It presents the background, statement of the problem, objectives, significance, and the data type and sources of the study. The organization of the thesis is also described at end of this chapter.

1.1. Background of the study

Corruption which is defined by World Bank as “the abuse of public office for private gain” has a long history. Most of the literature (Kaufman, 1997; Tanzi, 1998, to mention some) cite the quotation, “just as it is impossible not to taste honey or poison that one may find at the tip of one's tongue, so it is impossible for one dealing with government funds not to taste, at least a little bit, of the King's wealth”, from the book of ‘Arthashastra’ by Kautilya (4 B.C) to indicate its persistence in human history. Shah (2006) also cite the statement by Aristotle in 350 B.C. “... to protect the treasury from being defrauded, let all money be issued openly in front of the whole city, and let copies of the accounts be deposited in various wards” which partly indicates the prevalence of the problem of corruption during the ancient time and partly the importance of transparency to fight corruption.

Much of the discourse in the antiquities focused on illegal trade and the theft of public revenue. However, it is apparent that corruption is much more than those, and is corrosive to the state. The issue had been ignored in the literature and in the public discourse until 1970s. It emerged as an issue of international concern in 1990's as the international community become cognizant

of its crippling effects (Khemani, 2009) and consequently, a burgeoning literature has emerged.

As is the case with many controversial social issues, corruption has its own controversies in the literature. Different views prevail regarding the harm and benefits of corruption. The proponents of the beneficial effects of corruption rest their justification on the so-called “grease the wheels” hypothesis. Leff (1964) argues that corruption promotes economic growth reasoning that in a society where insufficient laws and regulations exist, corruption greases the wheels and reduces inefficiency. Lui (1985) supports this view in his analysis by using a game theoretic model and shows that in a system with a queue, it may be optimal to allow bribe to jump the queue so that waiting costs gets minimal. Huntington (1968), Leys (1965), Lien (1986), and Beck and Maher (1986) are some among those who support and show the benefits of corruption. They argue that corruption is a good means to compensate the ill-functioning of institutions, which is especially true in developing countries where the latter is particularly the case.

By contrast, many findings show that corruption has an adverse effect on both social and economic variables such as trust, public participation and perception, investment, growth, distribution, poverty, markets, etc. It is argued that the ‘speeding/greasing’ argument may not happen due to the exogenous nature of the slow process. Officials or civil servants may cause delays that otherwise would not have been, with the objective to extract more bribes. Moreover, the “grease the wheels” hypothesis may not hold because an ill-functioning bureaucracy is often characterized by an administration with successive decision centers, which increases the delays instead of speeding them up (Meon P.G and Sekkat K., 2005).

Kurer (1993) argues that corrupt officials have an incentive to create other distortions in the economy to preserve their illegal source of income. The increased number of transactions due to bribe may well offset the increased efficiency with which transactions are carried out. One distortion adds up over the other instead of compensating it. Bardhan (1997) points out that the inherent uncertainty of corrupt agreements may simply make the efficiency-enhancing mechanisms ineffective. Therefore, it is likely that corruption may increase the risks associated with a weak rule of law instead of compensating it. These justifications, in general, are known to be “sand the wheels” hypothesis.

Besides the uncertain nature of the activity, corruption has an adverse effect on the economy of a nation. For instance, corruption increases poverty and makes it more persistent (Rose-Ackerman, 1997). Using cross-country regressions over the period (1980-1997) Gupta, Davoodi, and Alonso-Terme (1998) showed that high and rising corruption increases income inequality and poverty. The works of Sheifer and Vishny (1993), Mauro (1995, 1996), Tanzi and Davoodi (1997), Tanzi (1998), N’ZUE and N’GUESSAN (2005), and Negin, et.al (2010) show that corruption works against economic development, growth, equity, poverty reduction, and social welfare.

1.2. Statement of the problem

Corruption is pervasive in developing countries. The Africa Development Indicators report (2010) indicates that corruption in the African continent is multifaceted and is a major challenge for development. According to the report, corruption in the continent ranges from “big-time” to “quiet” corruption¹. The complexity of the matter is more pronounced because the latter, which

¹ ‘Big-time’ corruption refers to administrative and political corruption at the highest government level. ‘Quite’ corruption indicates deviation from an expected conduct at lower level which includes various types of malpractice of frontline providers (that may/may not involve monetary exchange).

is characterized as the malpractice by the frontline providers, is widespread in the continent. In addition, a large number of citizens in the region rely on the services provided by the government for their key needs. This undoubtedly makes the poor more vulnerable. Corruption in any form, 'big-time', 'quiet', or other form, thus, has both immediate and long term consequence on households, firms, and businesses in the continent.

The Transparency International Corruption Perception Index (2009) indicates that corruption is a major issue in Sub-Saharan Africa (SSA) countries. Almost 70% of the investigated SSA countries scored an index below three, indicating that corruption is rampant. In comparison, this proportion is about 33% in the America, 43% in the Asian Pacific region and 55% in Eastern Europe and Central Asia. In sixteen of thirty five countries considered in SSA, 50% of the firms reported an expectation of informal payments to get things done (Africa Development Indicators, 2010). A working paper of Overseas Development Institute (ODI) by Hadley et.al (2009) indicates that corruption is among the main drivers and maintainers of poverty in SSA. This indicates that corruption in the region should be addressed when governments and international organizations plan towards development strategies.

In today's world, around 1.75 billion people, living in the 104 countries covered by Human Development Report (2010), are categorized as poor. Among these, those living in SSA constitute the lion's share. The incidence of poverty in the region ranges from three percent in South Africa to 93 percent in Niger, with an average of 45-69 percent. The Human Development Index score for most countries of SSA has stagnated or declined since 1990, leaving this region as the poorest in the world. Thirty five out of the 42 of the countries with low level of human development are in SSA (UNDP, 2010).

To these end, the theoretical framework regarding the link between corruption and poverty in this study is examined in the structuralist's approach of explaining poverty. In other words, the problem of poverty is because of social, economic, and political structures that constrain people's choices. According to the review by Ulimwengu (2006), millions of people may get poor no matter how hard they work and no matter what their skills are, which is much more attributed to the structures in which they are in. Poor people are poor because of the circumstances beyond individual control such as lack of basic education, adequate health coverage, job opportunities, political participation, protection from abuse, good governance, and other conducive factors necessary to get out of poverty. Even in a situation when countries perform exceptionally well in alleviating poverty, significant proportion of their countries may remain poor merely due to structural barriers.

Among the structural barriers, corruption and governance are obviously of greater share. Therefore, in order for the efficiency of huge capital investment and efforts that are being exerted by governments and donors to eradicate poverty in SSA, it seems mandatory that the issue of corruption and governance must be dealt with. In a course to deal with corruption, governance, and poverty, understanding the nexus and the direction of causality between them is important.

1.3. Objectives of the study

The main purpose of this study is to investigate the relationship between corruption and poverty based on the notion of causality and their nexus with governance quality in the context of panel data. The study also has the following specific objectives:

- To examine the nexus between corruption and poverty in the context of SSA countries.

- To investigate the direction of causality between corruption and poverty.
- To examine how much good governance is important in eradicating poverty.
- To examine the effects of governance on corruption.

1.4. Significance of the study

The last thirty years have seen a revival of the analysis of institutions despite its disappearance in the economic literature earlier on. Institutions defined as “the rules of the game in a society or the humanly devised constraint that shape human interaction” (North, 1990) play a significant role in addressing issues of development and poverty alleviations (Kumsa and Mbeche, 2004). Poorly constructed and ill-functioning institutions that are visible in developing countries are seen as the main reason for their failure to catch-up in their development process (Knack and Keefer, 1998). They further state that the widening gap between poor and wealthier countries, in contrast to ‘the convergence expected from the diminishing returns to capital in developed nations’², is largely attributable to the deficient institutions underlying in the poor nations.

It is now widely accepted that improving the conditions of the poor is both a widespread political demand and central to the realization of the Millennium Development Goals (MDGs) and other international obligations. Improving governance is obviously an integral part for achieving these goals. Where the mechanisms of good governance are weak or lacking as it is the case for SSA countries, poor people are often marginalized and development outcomes suffer (Kumsa and Mbeche, 2004).

² Knack and Keefer assume neo-classical economics. Provided that technology is exogenous, diminishing marginal productivity of capital in developed nations is expected to reduce the gap between developing and developed nations. The failure of the convergence, according to them, is attributed to institutional problems in poor nations.

Corruption with its multifaceted mechanisms affects an economy and its society by undermining democracy and the rule of law, violating human rights, distorting markets, eroding quality of life, retarding economic growth, and increasing inequality and poverty. Corruption damages the interests of the poor especially those who are exceptionally poor by diverting resources from the provision of basic services, by protecting from enjoying equal rights and getting means of development, and by marginalizing them from much more benefits (Tanzi 1998; Gupta et.al 1998; Rose-Ackerman 1997; Chetwynd et.al 2003).

According to Transparency International (2008), donors and governments treat corruption and poverty as separate rather than integral components of the same strategy. This might have undermined efforts to fight both corruption and poverty. Most of the studies that have investigated the link between corruption and poverty in both developing and developed countries show the causality between the two variables in a form of models that indicate correlation between the variables. Investigations on existing causal relationship between corruption and poverty based on a panel data analysis, beyond such correlation setup, are few.

Policy recommendations for a country where corruption and poverty are detrimental require careful investigation as to whether corruption causes poverty or it is the other way round. Therefore, we would like to address this gap in the literature by inferring from causality model. In addition, the study humbly contributes to the available evidence on good governance and poverty relationship, by using international data for SSA countries. It can also justify the need to emphasize on governance matters as much as we do in micro and macro policies in combating corruption and eradicating poverty. The study differs from previous studies at least in the area of coverage, method of analysis, and recentness, particular to the study area. Moreover, the study

can help governments, policy makers, international donors, and development agencies that work in SSA in providing clear justification on the fight against corruption and poverty and may help to reexamine (or strengthen) their policies and strategies.

1.5. Scope and limitation of the study

The study addresses the relationship between corruption and poverty based on the notion of causality. The direction of causality between them and their nexus with governance quality are also looked into. The literature identifies different channels such as growth, investment, public revenue and expenditure, competition conditions, trust on public institutions, etc to show the effects of corruption. This study, however, focuses merely on the relationship and causal link between corruption and poverty as well as the effect of governance indicators, disregarding the channels of the effect. The investigation is confined to SSA, taking group of countries based on the availability of data on all variables of interest.

Various challenges faced in the process of this study. Data accessibility and data variation between different sources are among the problems. International data sources often blame poorly functioning institutions and under development of the society in Africa, as an obstacle to generate data for the region. Particularly, data on corruption and governance are often difficult to collect because of the very nature of the phenomenon. Some sources, however, provide proxies to those variables. The data problems are carefully handled by referring to previous studies and selecting better sources. Despite the appropriate solutions given to the problems, results of some variables have to be interpreted with caution depending on the definitions attached to the variables for this particular study.

1.6. Data Type and Source

The study uses panel data for its advantage of accommodating the good identities of both the cross-sectional and time-series data; and due to the dynamic nature of the variables of interest. In recent times, panel data has become widely used to estimate dynamic econometric models. Panel data outweighs the cross-sectional data at least in providing sufficient information about earlier time periods especially if the relationship to be investigated has dynamic nature. It has also advantages over the time-series type data in that it offers greater scope to investigate heterogeneity in adjustment dynamics between different types of individuals/countries. Panel data by blending inter-individual differences and intra-individual dynamics have relatively greater capacity to capture complex behavior than data sets with only a temporal or a cross-sectional dimension (Hsiao, 2003).

The study considers annual data for 23 sub-Saharan Africa countries for the years from 2000 to 2009. Data (for a particular variable) for all countries are taken from a single source to keep its consistency and to avoid possible biases due to difference in measurement techniques. The data sources for this study are World Development Indicator (WDI, 2010), United Nation annual Human Development Reports, Transparency International annual reports, and World Bank Governance Indicators database.

Annual data of Corruption Perception Index (CPI) published by Transparency International is taken as a proxy for corruption data. The annual CPI is the best known transparency international's index of corruption which ranks 180 countries in an index between zero and ten (where 10 indicates the lowest) by their perceived level of corruption, as determined by expert assessment and opinion survey. The perceived level measured by this index is those of public-

sector corruption in a country; and the highest 10 indicates very low corruption in the country and zero refers to the case where most transactions/relations are tainted by corruption.

However, this index is not without limitation. It only reflects perceptions, not objective and quantitative measures of actual corruption. Despite its limitations, most researchers (Gupta et al, 1998; N’ZUE and N’GUESSAN, 2005; Negin et.al, 2010; Mauro, 1995, 1998; Tanzi, 1998; etc) use the index among the available measures of corruption. Tanzi (1998) argues that developing a measure that indicates the quantitative amount of corruption in a country is difficult and it is not even clear for what one wants to measure. Simply measuring bribes paid would ignore a whole range of corrupt acts which are not accompanied by the payment of bribes. Similarly, if one attempts to measure acts of corruption rather than the amounts of bribes paid, there is a possibility to count many relatively unimportant actions and also faces difficulty in identifying each act. Other perception-based surveys from Global Competitiveness Report, Political and Economic Risk Consultancy, Political Risk services, and other organizations often lack data for developing countries especially those of sub-Saharan Africa’s in addition to similar problems claimed with measurement technique. Therefore, we have chosen CPI as a proxy for corruption.

The decision about what data to take for poverty depends on the type of associated problems to be addressed in the study. The argument basically dwells on the remaining controversy on the definition of poverty (Ravallion, 1996). Some advocates the use of head count ratio while others prefer to use poverty gap, or squared poverty gap. Others, still, use Human Poverty Index (HPI) especially for an analysis particular to developing countries. There is no measurement of poverty so far except the Multidimensional Poverty Index, published for the first time in United Nation Human Development Report (2010), than the HPI to better reflect the poverty level in

developing countries beyond the material well-being. We prefer HPI³ because it includes the most basic dimensions of deprivation such as a short life, lack of basic education, and lack of access to public and private resources. The notion of HPI is introduced by the 1997 Global Human Development Report. The report defined human poverty as “the denial of choices and opportunities to lead a tolerable life” which is beyond lack of material wellbeing.

Data for other variables such as inflation, rural population, and gender are taken from World Development Indicator (WDI, 2010) database. Inflation data considered for this particular study is Consumer Price Index, as often suggested for studies that need to take into account the cost of living in a country. Rural population represents the percentage of rural population out of the total population. The variable Gender indicates female labor force participation rate (or female in labor force as a percentage of total labor force).

Governance quality data is also from World Bank Governance Indicators database. Governance quality is calculated from the database as the average of five indicators- voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, and rule of law. Though the World Bank Governance Indicator comprises ‘control of corruption’ as one of the governance indicators, we excluded it from the components of governance quality data developed for this particular study. The exclusion is basically to enhance the power of other governance indicators in explaining corruption and poverty, as a separate corruption measure (CPI) is already considered. Moreover, its inclusion may result in severe multicollinearity problem in poverty regression since it is somewhat similar with

³ $HPI-1 = [1/3(P_1^\alpha + P_2^\alpha + P_3^\alpha)]^{1/\alpha}$ where P_1 = the probability at birth of not surviving at age 40 (times 100), P_2 = adult illiteracy rate, $P_3 = 1/2$ (population not using an improved water source) + $1/2$ (children underweight for age), and $\alpha = 3$. The details are found in technical note for human development calculation by Doraid (1997).

corruption perception index (CPI). In the separate regressions on corruption model, each of the five governance indicators is considered separately.

The governance indicators data developed by the World Bank are rescaled for this particular study. The original scale that ranges from -2.5 (the lowest) to 2.5 (the highest) is rescaled to an index between 0 and 1. That is, rescaling is made by adding the lowest value (2.5) equally to all observations and dividing the new observation for the new maximum (5). Such a rescaling helps to enjoy the benefit of avoiding the complication arises in dealing with negative numbers and of possibility of transforming to logarithm forms (when needed) without affecting the measurement.

1.7. Organization of the Paper

Following the discussions in this chapter, the ensuing part of the thesis is organized as follows. Chapter two discusses both theoretical and empirical literatures. This is followed by the discussion of model specification and estimation method in chapter three. Chapter four discusses descriptive and econometric results of the study. The last chapter presents conclusions and implications from the study.

CHAPTER TWO

Review of Literature

This section of the thesis presents critical review of relevant literature focusing on both the theory and empirical findings. The theoretical literature comprises governance concepts, definitions, features, causes, and consequences of corruption along with its basis and nature in Africa, and poverty's definition, features, and causes. The empirical literature includes numerical findings at different times and in different countries regarding corruption-poverty nexus as well as the effects of governance and institutional qualities on corruption, poverty, and the economy at large.

2.1. Theoretical Literature

2.1.1. Governance concepts

Many economists and other people have been arguing presenting the assertion that poverty can be significantly reduced and 'under development become history' once the 'underdeveloped nations' 'get their policies right', disregarding the importance of good governance. It is believed that the major reason for developing nations to remain poor is lack of appropriate economic policies. For instance, World Bank (1993a) was arguing that the continuing economic problems in Africa are largely attributed to a failure to carry liberalization far enough (Grindle, 2007). A 'right economic policy' is, in fact, crucial for development. Recent literature, however, addresses that the quality of institutions and Governance are as important as economic policies.

Recent development of the economic discipline- the New Institutional Economics- indicates that economists have come to agree that institutional deficiencies are at the root of many economic

problems. The neoclassical economics focus on markets and its equilibrating process for resource allocation has proven ineffective since it disregard how economic relationships are structured and how alternative institutional forms contribute to development (Herath, 2005).

The concept of Governance has acquired increased importance since the 1990s largely because international aid agencies and donors began to recognize its absence as a barrier to economic developments in developing countries. It was in 1989 that the concept was highlighted for the first time in the World Bank's document on SSA, though it is as old as human civilization (Herath, 2005).

Different organizations define governance differently, based on their area of focus. The World Bank defines it as “the manner in which power is exercised in the management of the country's social and economic resources”. The OECD also defines the concept as “the use of political authority and exercise of control in society in relation to the management of its resources for social and economic development”. UNDP's definition of Governance under the parameter of sustainable human development is as “a framework of public management based on the rule of law, a fair and efficient system of justice, and broad popular involvement in the process of governing and being governed, which requires establishing mechanisms to sustain the system and to empower people and give them real ownership of the process ” (Sirvastava, 2009). These definitions, in spite of their difference in expression, collectively emphasize the importance of non-abused power by government if it needs to work for development.

Control of corruption, according to World Bank's working papers, is one of the components of governance indicators of countries. The World Governance Indicators (WGI) consists of six broad dimensions of governance: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of

Corruption, all of which clearly accounted to show the importance of governance in a country's development (Kaufman et.al, 2010).

Since governance is the process of decision-making and the process by which decisions are implemented, an analysis of governance focuses on the formal and informal actors involved in decision-making and implementing the decisions made and the formal and informal structures that have been set in place to arrive at and implement the decisions. Managing the actors in support of public welfare is basically the work expected from a government. Even in an ideal 'pure market economy', governments are expected to perform certain key governance functions including maintaining macroeconomic stability, developing infrastructure, providing public goods, preventing market failures, and promoting equity (Sirvastava, 2009). It is, therefore, mandatory for African governments especially for those of sub-Saharan to combat corruption if they need to achieve MDGs and realize development.

2.1.2. Corruption

2.1.2.1. Definition and Features

Corruption has become a widespread phenomenon in the world, taking a top priority on the agendas of governments (both developed and developing), development organizations and banks, researchers, economies, and citizens. According to Sardan (1999), "corruption has become a common element of the functioning of the administrative and para-administrative apparatus, from top to bottom, in almost all African countries".

The term corruption is used to mean different things in different contexts. Due to the existence of corrupt practices throughout the world both in developed and developing countries, people

attach various practices to corruption differently on the basis of their culture and norms. Tanzi (1998) indicates the debate on the definition of corruption by a statement: “a few years ago, the question of definition absorbed a large proportions of the time spent on discussions of corruption at conferences and meetings”.

Sardan (1999), emphasizing the moral economy, explained the complexity of the phenomenon particular to Africa. The author argues that

The moral economy of corruption in Africa does not merely concern corruption in the strict sense of the word, but rather the 'corruption complex' in a wider sense, which covers a number of illicit practices, technically distinct from corruption, all of which none the less have in common with corruption their association with state, parastatal or bureaucratic functions, and also contradict the official ethics of 'public property' or 'public service', and likewise offer the possibility of illegal enrichment, and the use and abuse to this end of positions of authority (p. 3-4).

Despite the complexity of the phenomenon, different observers often agree on whether a particular practice connotes corruption. Most working papers by World Bank, UNDP, and other international organizations define corruption as “the use of public office/authority for private gain”, without denying the possibility for variation in included practices between countries. USAID hand book on fighting corruption (1999) as cited in (Chetwynd et.al 2003) define corruption as “the misuse of public office for private gain including, but not limited to embezzlement, nepotism, extortion, influence peddling, and fraud”.

Corruption as broadly defined by Lawal (2007), is

a systematic vice in an individual, society or a nation which reflects favoritism, nepotism, tribalism, sectionalism, undue enrichment, amassing of wealth, abuse of office, power, position, and derivation of undue gains and benefits. Corruption also includes bribery, smuggling, fraud, illegal payments, money laundering, drug trafficking, falsification of documents and records, window dressing, false

declaration, evasion, underpayment, deliberate bending of rules of a system, deceit, forgery, concealment, aiding and abetting of any kind to the detriment of another person, community, society or nation (p.2-3).

Whenever a public office is abused, the public objective is set aside or compromised. It is only if a public function is unproductive that policy goals are not harmed by corruption.

2.1.2.2. Causes of Corruption

Literature regarding causes and consequences of corruption are not few. Most of them show that both causes and consequences of corruption that are common to all countries are subject to debate. They depend on country's social, political, and economic backgrounds. Ndikumana (2006) asserts that the theoretical research on the causes and vehicles of corruption draws from the work of Bhagwati (1974), Krueger (1974), and Rose-Ackerman (1978), among others. The literature characterizes corruption as the outcome of some form of government regulation that creates opportunities for rent.

While definite causal linkages are difficult to establish, literature suggests that wherever these factors exist corruption will prevail. These factors include weak rule of law, low wage of civil servants, wider discretionary power owned by politicians, legacy of colonial rules, historical dominance of the state in economic and political affairs, and interest to keep status quo, among others. Some indicate that due to the unstable political condition and the uncertain future in developing countries, officials and civil servants prioritize corruption benefits to keep their own living and that of extended family for the future (Ampratwum, 2008; Aidt, 2003).

Tanzi (1998) classifies the causes of corruption as factors that affect demand and those that affect supply for/of corrupt acts. The most important factors affecting the demand side include authorization and regulations, bad characteristics of tax system, spending decisions, and

provision of goods and services at low market prices. The supply promoters include bureaucratic tradition, level of public sector wage, the penalty systems, institutional controls, the transparency of rules, laws, and processes, and the examples provided by the leadership. He further argues that the growth of international trade and business and the economic changes that have taken place in many countries and especially in the economies in transition have contributed for the spread of corruption.

Voskanyan (2000), acknowledging to Leslie Holmes (1993) classifies the causes of corruption in to three categories: cultural, psychological and system related. He argues that some acts of corruption may be acceptable mainly due to the traditional political culture in many poor countries. Traditional societies in these countries are often criticized for their inability to identify ‘gifts’ from ‘bribe’⁴, which undoubtedly make the problem persistent. Weak tradition of rule of law may also have contributed in promoting corruption.

Among the psychological factors indicated are ‘the evil nature’ of some individuals, peer-pressure associated with individual’s relationship with a group, and fear of not acting in a similar way for his/her supervisor and of under-fulfillment of a plan. The author also addressed the type of government structures and different dimensions of institutional structure such as the monopoly power of officials, the degree of discretion by officials, and the degree of accountability and transparency in institution as a system related causes of corruption.

Most cross-sectional studies indicate that poverty is among the causes of corruption, presenting the following theoretical reasoning. The poor population often have low education, less exposure to media, low political participation, and less asset or wealth which would have give them the capacity to protest and complain further on corrupt acts. These factors that can be

⁴ See also Rose-Ackerman (1998a) and Tanzi (1998) for discussions on gifts versus bribes.

stated as both the supply and demand side drivers particular to the poor may make them accept and practice corruption (You and Khangram, 2005).

2.1.2.3. Consequences of Corruption

The debate on the impact of corruption as beneficial and harmful are commonly categorized as “grease the wheels” and “sand the wheels” hypotheses. While the former evidenced the ill-functioning inefficient institutions in developing countries as reason for the advocacy of corruption, the latter strongly argue that, under whatever circumstances, the net effect of corruption does not show the supplementary role, rather a persistent national welfare loss.

It has been argued that corruption can enhance political participation for historically marginalized and deprived individuals, groups, and communities (Bayley, 1966). In the same study, it is indicated that “corruption, whether in the form of kickbacks or of payments originating with the briber, may result in increased allocations of resources away from consumption and into investment”. He explained that civil servants, who represent a relatively more educated and skilled group than the rest of society in the African and other developing countries, have more information about economic growth and prospects for wealth creation than ordinary people. Hence, corruption helps to transfer scarce resources to members of the civil service who, according to the author, have a higher propensity to invest in the creation of wealth (and hence, economic growth) than the individuals who bribe them.

Lui (1985) indicates that in a system with a queue, it is optimal to allow bribe to jump the queue so that waiting costs remain minimum. Leff (1964) also advocates corruption to bring economic growth in a country with weak rule of law and poor institutions. Huntington (1968) agrees that corruption can help to overcome tedious bureaucratic regulations and enhance growth. He

strengthen his argument by stating “In terms of economic growth, the only thing worse than a society with a rigid, over centralized, dishonest bureaucracy is one with a rigid, over centralized, honest bureaucracy”.

According to Beck and Mehar (1986) and Lien (1986), corruption can reduce the problem of information asymmetry in decision making. It may improve the choice of the right decision by officials since the ranking of bribes can replicate the ranking of firms by efficiency. Leys (1964) and Bayley (1966), emphasizing on the quality of civil servants, argue that benefits from corruption acts in public sector compensates the low wages in the sector and hence attract quality professionals from other sectors.

In recent years however, the forces that consider corruption as beneficial to economic and political development have all been discredited. Though corruption may benefit, such benefits are completely negated by their costs. It has generally stunted the creation of wealth and severely limits the government’s ability to deal effectively with poverty and deprivation.

Tanzi and Divoodi (1997) find that Corruption tends to increase the size of public investment (at the expense of private investment among other things) because many items in public expenditure lend themselves to manipulations by high level officials to get bribes. Corruption also skews the composition of public expenditure away from needed operation and maintenance towards expenditure on new equipment. It also skews the composition of public expenditure away from needed health and education funds, because these expenditures, relative to other public projects, are not easy for officials to extract rents from. They added that corruption reduces the productivity of public investment and of a country’s infrastructure. Further, it reduces tax revenue because it compromises the government’s ability to collect taxes and tariff.

Corruption, according to Gray and Kaufman (1998), also leads to the over budgetary of defense contracts at the expense of rural health clinics. Less manipulatable public projects do not get in to budget adequately, even if they have high social value. It is argued that to the extent that rural residents tend to have lower incomes than their urban counterparts, this corruption-induced policy bias may worsen the income distribution, and at the same time, divert the needed resources away from rural.

Nbaku (2008) strongly argue against the efficiency enhancing argument, through the transfer of resources, stating the real experience of African civil servants for the last fifty years. He asserts that African civil servants to whom a large proportion of resources went for the last fifty years fail to develop into entrepreneur as evidenced by most of business activities in African countries are still dominated by foreign interests.

Corruption encourages competition in bribery, rather than competition in quality and in the price of goods and services. It inhibits the development of a healthy market (Zemanovicova et.al, 2002). Ades and Di Tella (1994) added to this argument by making a strong conclusion that “more competitive countries should be less corrupt”, to indicate that corruption has a potential to destroy market competition.

A number of studies show that corruption exacerbates poverty and deprivation. Gupta et.al (1998) relates corruption and poverty in two channels. One is through the impact of corruption on growth. They, presenting the finding by Ravallion (1997) that a higher growth rate is associated with a higher rate of poverty reduction, argue that corruption slows the rate of poverty reduction by reducing growth. The other is through its impact on income inequality. Corruption, according to them, creates biased tax system which favors the ‘haves’ and hurts the

‘have-not’ and thereby aggravates income inequality. It also results in poor targeting of social programs, diversion of human capital distribution and formation, and increase in risk on investment premium of the poor which end up in inequality and poverty.

Rose-Ackerman (1997) indicated several channels through which poor people are hurt by corruption. Due to corruption the poor will receive a lower level of social services, infrastructure investment will be biased against projects that help the poor, the poor may face higher tax or fewer services, they are disadvantaged in selling their agricultural products, and their ability to escape poverty through indigenous small enterprise is reduced.

Literature often categorizes the link between corruption and poverty into two models; the “economic model” and the “governance model”. The “economic model” postulates that corruption affects poverty by first impacting economic growth factors, which in turn affect poverty levels. In other words, corruption reduces investment, distorts market, hinders competition, creates inefficiency by increasing the costs of doing business, increases inequality, and as a result exacerbates poverty (chetwynd et al, 2003).

The “governance model” asserts that corruption affects poverty by first influencing governance factors, which in turn impact poverty levels. Corruption disrupts governance practices, destabilizes governance institutions, reduces the provision of services by government, reduces respect for the rule of law, and reduces public trust in government and its institutions. These reduce the capability of government to support its citizens and particularly hurt the poor (Ibid).

The extent of the impact of corruption is often related to the institutional and infrastructure development levels of a country. Choudhary (2010) in his analysis about the impact of corruption on growth in India asserts that states with poor social and economic infrastructure

feel the impact of corruption more adversely. This implies that corruption hurts poor countries like Africa more than their counterparts though the effect on growth of both categories of countries is adverse. Handley et.al (2009) also categorizes corruption among the political-economy maintainers and drivers of poverty in sub-Saharan Africa.

Apart from the negative social and economic consequences, corruption has also a political impact. It is one of the tools used by politically dominant groups to monopolize political spaces and limit the participation of certain ethnic, social, and racial groups. In a corrupt environment, the citizens lose their confidence in the country and in the rules. Not only the rule of law is put in question, but also democracy and moral declines and criminality grow. Corruption undermines democratic development, inhibiting the performance of public institutions and the optimal use of resources. It feeds secrecy and suppression (Zemanovicova et.al, 2002).

Johnston (1986) suggests that serious corruption threatens democracy and governance by weakening political institutions and mass participation, and by delaying and distorting the economic development needed to sustain democracy. Some, still, argue that the relationship between corruption and democracy is not yet clear especially for Africa. Sardan (1999) argues that establishing democracy in a number of African countries has done nothing to put a brake on corruption. Even if democracy has the capacity to reduce corruption, Africa has left behind from enjoying this remedial tool. Rose-Ackerman (1997) argues that many African remain autocratic though some of them have made substantial progress in establishing democratic governments. They are either unabashedly autocratic or are nominal democracies with strong one party or one man rule; even in the case when power rotates between rulers they are not the result of 'appropriate transition'.

2.1.2.4. The state, nature, and bases of corruption in Africa

Corruption is one of the serious afflictions confronting Africa today. It is not only rampant throughout the continent but also deep rooted in the society, the public domain, and critical sectors of the continent. Corruption has legal, political, and economic implications. It has also a negative consequence on the Africa's recovery effort for human and social development, and on areas such as the environment (Africa Development Indicators (ADI), 2010).

According to estimates of the African Union, African economies lose more than US\$ 148 billion a year as a result of corruption. Most African countries are characterized by what is termed "embedded levels of corruption", involving inter-woven networks of politicians, bureaucrats, the private sector, and the security sectors (Khemani, 2009). According to the United Nations estimate in 1991 alone, more than 200 billion dollar in capital was siphoned out of Africa by the ruling elites. This wealth resulting from corruption forms part of capital flight and on an annual basis exceeds what comes to Africa during the year as foreign aid. The amount was also more than half of African foreign debt, during the time.

The evidence by George Ayittew (2002) mentions some of the amount of money taken by leaders as published by French weekly (may 1997). These are 20 billion dollar by General Sani Abacha of Nigeria, 6 billion dollar by president H. Boigny of Ivory Coast, 4 billion dollar by Mobutu of Zaire, 2 billion dollar by president Mouza Traore of Mali, 200 million dollar by president Denis N'gnesso of Congo, and 30 million dollar by president Mengistu H/Mariam of Ethiopia, to mention a few (Lawal, 2007).

Corruption in Africa is multifaceted. It ranges from "big-time" to "quiet" corruption. The complexity of the matter is more pronounced because the latter, which is often characterized as

the malpractice by the frontline providers, is widespread in the continent. In addition, the fact that a large number of citizens in the region rely on the services provided by government for their key basic needs makes the poor more vulnerable (ADI, 2010). The latest transparency international corruption perception index indicates that almost 70 percent of the investigated SSA countries score below three (where 0 show the most corrupt and 10 show the least).

Different arguments have been put to explain the pervasiveness of corruption in Africa. These include poverty, personalization of public office, political culture, tradition of the society, and the inability of leaders to overcome their colonial mentality. In Africa, the basic information on corruption is difficult to come by and officials are not often forthcoming in discussing the problems of corruption. The absence or poor functioning of 'freedom of information' laws often makes it impossible to compel government officials to give basic data on government operations and project budgets. Civic society and mass media in Africa are poor in exposing corruption acts. Civic societies in many African countries are weak, unorganized and in an embryonic stage of organization while the mass media is undeveloped, lacks trained man power and resources, and is highly influenced by politics (African Development Bank Group, 2003).

The historic factors obviously contribute for the current rampant and complex corruption in Africa. Some even argue that it is rational for African civil servants and officials to practice corruption, as they have seen nothing done on their rulers by international organizations for the crime they did/are doing on their people and country. The argument indicates that corruption in Africa is vicious and the people developed a sense of tolerance thinking as if there will be no way out.

2.1.3. Poverty

2.1.3.1. Definition and Features

Poverty is often defined as the lack of access to necessities. The definition evolves over time from the only focus on lack of a standard dollar amount necessary for basic needs such as food, shelter, and medical care to the denial of access to basic and comprehensive economic, social, and political needs and rights.

Most researchers working on poverty in developing countries contexts have dissatisfied with the money metric measures, which defined poverty as lack of a certain standardized minimum amount of money essential to purchase basic needs at standard prices. Measuring poverty in terms of GDP or Purchasing Power Parity does not fully capture the phenomenon of poverty. A broader definition treats it as multidimensional, including low income, low levels of education and health, vulnerability to (income loss, natural disaster, crime and violence, education curtailment), and voicelessness and powerlessness (feeling discrimination, lacking income earning possibilities, mistreatment by the state institution, and lacking status under the law) among the many aspects of well-being (Chetwynd et al. 2003).

Mattes (2008) describes the multidimensionality of poverty by acknowledging to the definition by the 1995 world summit on social development in Copenhagen.

Poverty has various manifestations, including lack of income and productive resources sufficient to ensure sustainable livelihoods; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illnesses; homelessness and inadequate housing; unsafe environments and social discrimination and exclusion. It is also characterized by a lack of participation in decision-making and in civil, social and cultural life Absolute poverty is a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities,

health, shelter, education and information. It depends not only on income but also on access to services (p. 8).

While measuring poverty in terms of income level seems relatively straight forward, the multidimensional approach may be more complex and include variables that are difficult to quantify. To manage this problem, researchers have developed indices such as the UNDP Human Poverty Index which conceives of poverty in terms of longevity, knowledge, and economic provisioning.

2.1.3.2. Causes of Poverty

A poverty profile often describes the pattern of poverty without due attention to why some people are poor. Poverty may be due to national, sector specific, community, household, or individual characteristics. Correlates indicate that poverty is high in areas characterized by geographical isolation, a low resource base, low rainfall, and other inhospitable climatic conditions. Regions with inadequate public services, weak communication and infrastructure, and underdeveloped markets are poorer than those with improved facilities (Haughton and Khandker, n.d).

Among the national/regional characteristics that affect poverty are good governance, economic and environmental policy, macroeconomic and political stability, mass participation, global and regional security, rule of law, and gender, ethnic, and racial inequality. At the community level, infrastructure which often includes proximity to paved roads, availability of electricity, proximity to large markets, availability of schools and medical clinics, access to employment, social mobility and representation, and land distribution is a major determinant of poverty. The age structure of household members, education, gender of the household head, and the extent of

participation in the labor force are some of the important household and individual characteristics that relates to poverty (Haughton and Khandker, n.d).

As reviewed by Ulimwengu (2006), there are two broad categories of explanation about the problem of poverty. The individualist approach and the structuralist approach. The Individualist theories argue that individual choices matter above all, while the structuralist theories assert that socioeconomic structures constrain people's choices and may inhibit them from developing and utilizing personal capacities to accumulate assets. He asserts that none of the approaches are sufficient independently, rather they augment one another to make the explanation complete.

According to the individualists view, responsibility for poverty is placed on the poor themselves who are thought to lack individual capacities such as attitude, motivation, and morals to overcome individual and social hurdles, and enabling them to generate enough assets. Culture of poverty theory, human capital theory, and status attainment theory are the prominent individualist theories of poverty that blame the poor themselves for remaining poor. These theories, however, neglect larger economic, social, and political structures' influences.

To this end, the structuralist approach to poverty focuses on those circumstances beyond individual control. Poor people are poor because they lack access to quality education, adequate health coverage, job opportunities, political participation, and by and large, they lack conducive environment (manmade or natural) necessary to get out of poverty. Poorly and ill functioning institutions and lack of good governance in developing countries in general and Africa in particular undoubtedly are among the factors driving poverty in the regions.

2.2. Empirical literature

Gyimah-Brempong (2002) found that corruption in African countries has a negative and statistically significant effect on the growth rate of income and is positively correlated with income inequality, in the continent. A one point increase in corruption decreases the growth rates of GDP by between 0.75 and 0.9 percentage points per year and of per capita income growth rate by between 0.39 and 0.41 percentage points per year, respectively. A one point increase in the corruption index is associated with a 7 point increase in the Gini-coefficient of income inequality.

Mauro (1995) demonstrates that high levels of corruption are associated with lower level of investment. Investment rises by about 2.9 percent following a decline in corruption by one standard deviation. The analysis by the same author in his 1996 study shows that an improvement in corruption perception index brings about a significant percentage increase in investment rate and hence, an increase in annual growth rate of per capita GDP. To put in his statement, “Regression analysis shows that a country that improves its standing on the corruption index from, say, 6 to 8 (0 being the most corrupt, 10 the least) will experience a 4 percentage point increase in its investment rate and a 0.5 percentage point increase in its annual per capita GDP growth rate”. Corruption acts as a special tax on businesses and introduces uncertainty, which may retard the propensity to invest by privates and in turn reduces economic growth.

According to Anoruo and Braha (2005), corruption has both direct and indirect negative effect on economic growth. Their results reveal that a one-unit increase in corruption retards economic growth by roughly 0.87 percent for the period under consideration. Similarly, a one-unit increase in corruption translates to about 4.69 percent decrease in investment share of GDP.

Pellegrini and Gerlagh (2004) also show that a one standard deviation decrease in the corruption index raises private investment by as much as 2.5 percentage points. This increase in private investment in turn raises GDP growth by about 0.34 percentage points.

The micro evidence from eight African capital cities by Razafindrakoto and Roubaud (2007) shows that corruption makes a greater hole in the poorest individuals' pockets when measured as the percentage of their income than the relatively richer ones. They found that households in the poorest quartile paid 7.8 percent of their income for corruption as opposed to 2.2 percent for the richest quartile. Gupta et.al (1998) also show that a one standard deviation increase in the growth rate of corruption cause a decline in the growth rate of the income of the bottom 20 percent of the population by 1.6 to 4.7 percent per year.

A comparative study by Li, Xu, and Zou (2000) to investigate the effect of corruption on income distribution and growth in Asia, Latin America, and OECD shows that corruption affects income inequality in an inverted U-shaped way and growth negatively. Corruption alone explains a large proportion of the Gini differential across developing and industrial countries. It explains almost half the Latin America-OECD Gini differential, and the entire Asia-OECD Gini differential. Corruption in countries with more inequality in asset allocation raises inequality to a lesser extent and reduces growth to a large extent. This study further asserts that more corrupt countries have lower schooling attainment, thinner financial depth, higher black market premiums, more unequal land distribution, higher government spending, smaller extent of foreign trade, and lower average income.

Tanzi and Davodi (1997) in a cross-national analysis of corruption and growth show that corruption reduces growth. The regression results indicate that higher level of corruption is associated with increased public sector investment (but decreased productivity), reduced

government revenue, lower expenditure on operations and maintenance, and reduced quality of public infrastructure. Lambsdorff (2003) provided evidence that corruption have a negative impact on capital accumulation by deterring capital imports. World Bank study (2000a) on 22 transition countries (cited in World Bank, 2000c) also suggests that corruption reduces growth through decreased investment and output.

Data analysis on the firms' perception of corruption in World Bank study (2000c) of poverty following the transition to a market economy in Eastern Europe and Central Asia show that more firms report as corruption is a problem in the region. The paper also shows that lower levels of corruption were seen to be statistically associated with lower levels of income inequality. Gupta et al. (1998) conducted cross-national analysis of up to 56 countries and found that higher corruption is associated with higher income inequality. That is, a worsening of a country's corruption index by 2.5 points on a scale of 10 corresponds to an increase in the Gini-coefficient of about 4 points. They also reported that corruption has lead to reduced social spending on health and education, lower tax revenue, and increases government costs.

A study on the relationship between the impact of corruption on growth and investment and the quality of governance in a sample of 63 to 71 countries indicates that corruption have a negative effect on growth and investment (Meon and Sekkat, 2005). They further found that corruption has a negative impact on growth independently from its impact on investment. It is also found that corruption supports and deepens inequality. Kerstedt (2001) in her study of 35 OECD countries tested corruption against income distribution. Results show that societies with high income inequality have high levels of corruption while those with high levels of secondary education and a high proportion of women in government positions have a decreasing level.

The analysis by You and Khagram (2005) on data from 129 countries shows that income inequality increases the level of corruption through material and normative mechanisms. The poor are not able to monitor the rich and this enables the rich to misuse their positions. A study on the effect of corruption on income inequality and poverty by Dincer and Gunalp (2008) using data from United State of America states reveal that an increase in corruption increases income inequality and poverty. One standard deviation in corruption increases Gini index and poverty by 0.3 and 0.5 percentage points respectively. Using Atkinson indexes, the author also evidenced that the effects of corruption on the lower end of the distribution are higher.

Johnston (2000), in a study of 83 countries, found that well-institutionalized and decisive political competition is correlated with lower levels of corruption. Chetwynd et.al (2003) reported that diagnostic surveys of corruption in Bosnia-Herzegovina, Ghana, Honduras, Indonesia, and Latvia show that government institutions with the highest levels of corruption tend to provide lower quality services, while the converse is also seen from the survey on Romania.

As a result of corruption, the public at large loses confidence in the government's ability to manage the economy in the interest of the people. Chang and Chu (2006) find a negative relationship between institutional trust and corruption, for four East Asian countries. Cho and Kirwin (2007) also demonstrate a vicious circular relationship between mistrust in state and experience with corruption. Their result suggest that citizens' experience of corruption lowers their trust in political institutions and that lower levels of trust are likely to increase the experience of corruption. Levellee et.al (2008), in their study about the link between corruption and trust in political institutions for 18 SSA countries, reveal that both experienced corruption

and the perception that corruption is widespread have a negative impact on citizens' trust in political institutions.

The study by Kaufmann et.al (1999) about the effect of governance on per capita income in 173 countries, treating the 'control of corruption' as one of the components of good governance, show a strong positive causal relationship running from improved governance to better development outcomes. A one standard deviation improvement in governance raised per capita income 2.4 to 4 times. Kaufmann and Kraay (2002), using governance data for 2000/01 particular to Latin America and Caribbean countries, found that better governance tends to yield higher per capita incomes. The study, on a sample of 97 developing countries over the period 1997-2006, by Negin et.al (2010) show that corruption and poverty go together with bidirectional causality. The results of all the specifications and the Granger causality test show that there is significant relationship between poverty and corruption.

CHAPTER THREE

Model Specification and Estimation Method

This section discusses the approaches to modeling corruption, model specification, estimation techniques, causality test, and diagnostic tests. Both the agency and the resource allocation models are briefed. The dynamic panel model along with system GMM estimation is given a detail including the shortcomings of other estimation techniques. Granger causality test in panel and other supplementary tests are discussed.

3.1. The Economic Model

Modeling the economics of corruption is not as such an easy task to researchers since the deal is about attaching an economic interpretation to a non-economic (political) variable. This part of the methodology section is, thus, included with an intention to give a brief on why corruption interests economists and how economists are thinking about corruption beyond its political sense.

Following Jain (2001), there are two approaches to modeling the different types of corruption—the agency model and the resource allocation model. An agency model views corruption as a factor affecting the incentives and constraints facing the legislators and examine its effect on their decisions. The model basically examines the issue of corruption in a situation of information asymmetry and considers it as non-problematic in the absence of information asymmetry between the principal and the agent.

In the case of corruption, however, the problem can arise not only when there is information asymmetry between the agent and the principal but also when there are problems of

enforcement (when the principal lacks mechanisms to fully hold the agent accountable for its behavior). Agents with a control over the political system can circumvent many of the checks and balances implemented by the principal; and hence, the principal is unable to enforce its implicit contract with the agent which in turn is the challenge to model building (Jain, 2001).

On the other hand, a resource allocation model views corruption as a cost in a supply-demand framework. The model considers that corruption changes the relative costs of inputs and outputs as well as the penalties faced by decision makers, and hence, the behavior of players in an economy as well as the total output. The most common application of this model is for rent seeking behavior where entrepreneurs attempt to escape the ‘invisible hand’ of the market and to redirect policy proposals for their own advantage. This model encompasses game theoretic application and the effects on market structure where the former shows the behavior of firms towards competitive rent-seeking and the latter addresses the effect on market equilibrium through its effect on the costs of resources.

Following the aforementioned briefs, it is apparent that the resource allocation model is more appropriate in dealing with the effects of corruption and in explaining the rationale behind investigating the issue of corruption⁵ like ours. Since we have no objective to investigate either the causes or the consequences or both of corruption, we limit our economic model in such a way that a political variable-corruption- has some relationship with an economic variable-poverty; and governance variables have correlation with both corruption and poverty.

In other words, our economic model is developed to show only corruption’s nexus with poverty and governance indicators. Thus, following Negin et.al (2010) we developed an empirical

⁵ See the details on the consequences of corruption from chapter three pages 19-23.

function: $Y = f(Y_{t-i}, X, Z)$ where Y indicates poverty or corruption, Y_{t-i} indicates the lagged values of poverty/corruption, X indicates corruption or poverty depending on what is assigned as Y , Z indicates the control variables such as inflation, gender, rural population, and governance quality. GDP per capita growth rate is also among the factors affecting poverty though it's excluded from corruption function. Y and X are denoted as poverty or corruption because we deal with two models where at one time poverty is the dependent variable and corruption is among the regressors; and in the second model vice versa. For the purpose of examining the effects of governance indicators on corruption, the dependent variable corruption is modeled as a function of its lags, poverty, inflation, gender, rural population, and each of the five governance indicators separately.

It is expected that corruption and poverty have positive correlation meaning increased corruption (lower index) show increased poverty and vice versa. Therefore, a negative sign result fits the expectation since corruption perception index is interpreted in opposite end (higher CPI indicates lower corruption and lower CPI indicates higher corruption). Regarding the control variables that are used as a mediator between poverty and corruption, each has their respective expected sign of association with the main variables.

Inflation, as one of the aspects of macroeconomic instability, can put a heavy burden on the poor. It is a regressive tax which its burden is especially carried by those in lower income groups since the poor often hold most of their wealth in the form of cash. In addition, the poor are less able than the rich to secure the real value of their assets from inflation. Further, inflation may affect even those who infrequently use cash since it, beyond a certain threshold, can constraints output growth (Ames et.al, 2002; cited in Negin et.al). In an economy where

agents can inflate the price of the goods needed to start an investment project, high and variable inflation may increase the cost of monitoring the agent and thus causes higher corruption and lower investment (Braun and Di Tella, 2000).

Gender which denotes the percentage of females in the labor force out of the total labor force has correlation with both poverty and corruption. Gender disparity in participation is believed to have economic consequences. According to Dollar and Gatti (1999) and Karstedt (2001), corruption is lower in a country with high gender equality as well as in an economy where women's participation in the public sector is higher. Studies also show that gender disparity retards economic growth and social development and increases poverty.

Poor governance retards economic growth and endanger positive development outcomes. It also generates illegality and corruption. Lack of transparency in rules and processes, poor controlling mechanisms, and absence of political freedom and stability generates a breeding ground for corruption and increases poverty. In many developing countries, rules are not often clear and their specifying documents are not available to people (Tanzi, 1998). Good governance reduces poverty in dimensions such as empowerment, capabilities, opportunities, and security, and increases poor's access to markets so that they become less vulnerable to agricultural shocks. It also comforts a ground to the poor to influence decision making through enhancing their participation in political and economic processes (Negin et al, 2010).

The fact that nearly 75 percent of the world's poor are located in rural areas (Ravallion, 1997) necessitates the consideration of the percentage of rural population out of the total population while dealing with poverty and other associated social and political problems. In most developing countries the likelihood of being poor and the severity of poverty are more in rural

areas (Cord, 2002; cited in Negin et.al, 2010). The poor infrastructure facility in rural areas prevents rural poor from participating on national policy debates and makes them weakly represented in national affairs. In addition, the diverse characteristics of this group widened their share of social, economic, and political powers and hence decline the transparency and accountability practices.

The effect of GDP per capita growth on poverty level in developing countries may show either positive or negative effects depending on the degree of the changes of income distribution (Roemer and Gugerty, 1997). Despite some evidences about the positive relationship between economic growth and poverty, most agree that poverty reduction in less- developing countries is possible only when economic growth is achieved as well as fair distribution of income from growth is realized (Ravallian, 1997). Thus, we expect negative sign as higher economic growth helps to reduce poverty.

3.2. Model Specification

Many economic relationships are dynamic in nature. The dynamic relationship between variables requires sufficient information about earlier time periods and greater deal with heterogeneity in adjustment changes, to arrive at efficient outcomes. In econometrics, the dynamics in a model is characterized by the presence of lagged dependent variable among the regressors (Baltagi, 2005). In such a case, it is rare that the conditional density of the outcomes (say, Y_{it}) conditional on a certain variables (say, X_{it}) are independently identically distributed across individual i and over time t . To capture the effects of those omitted factors it is common to assume that in addition to the effects of observed X_{it} , there exist unobserved individual

specific effects (μ_i) and time-specific effects (λ_t) which can be treated either as fixed constants or random variables (Hsiao and Tahmiscioglu, 2007; Baltagi, 2005).

In other words, the basic model for dynamic panel with additional explanatory variable can be written as $Y_{it} = \alpha Y_{it-j} + \sum \beta X_{it} + \varepsilon_{it}$, where $\varepsilon_{it} = \mu_i + \lambda_t + v_{it}$ (*)

where Y_{it} , $Y_{i,t-1}$, and X_{it} represent the dependent variable, the lagged dependent variable, and a vector of values of additional explanatory variables respectively. μ_i indicates individual-specific effect, λ_t indicates time specific effect, and v_{it} represents the disturbance term. $i = 1, \dots, N$ is cross-section and $t = 1, \dots, T$ is time periods.

Such type of model is characterized by two sources of persistence over time. One is the autocorrelation due to the presence of lagged dependent variable and the other is heterogeneity among individuals due to the individual effects. Since y_{it} is a function of μ_i , it follows that $y_{i,t-1}$ from the lagged equation is also a function of μ_i indicating that one of the regressors is correlated with the error term. In such a model, it is not necessary to specify models for the X_{it} series in order to estimate the parameters. The moment conditions to be considered depend on what is assumed about the correlation between X_{it} and the error terms (μ_i and V_{it}) (Bond, 2002).

The X_{it} series may be endogenous, predetermined, or strictly exogenous assuming the V_{it} disturbances are serially uncorrelated. The X_{it} also may or may not be correlated with the individual effect (μ_i). The X_{it} may be endogenous in a sense that it is correlated with the V_{it} and earlier shocks, but uncorrelated with V_{it+1} and subsequent shocks. In such a case, the X_{it} is treated symmetrically with the dependent variable Y_{it} ; and the lagged values X_{it-2} , X_{it-3} , and longer lags can be valid instrumental variables in the first differenced equations for periods $t=3$,

4,...,T. The X_{it} may be predetermined in a sense that the X_{it} and V_{it} are uncorrelated but the X_{it} may still be correlated with $V_{i,t-1}$ and earlier shocks. In this case, X_{it-1} is additionally available as a valid instrument in the first differenced equation for period t (Bond, 2002).

The X_{it} may be strictly exogenous in a sense that X_{it} is uncorrelated with all past, present, and future realizations of V_{it} s. In such a case, the complete time series ($X_{i1}, X_{i2}, \dots, X_{iT}$) can be valid instrumental variables in each of the first differenced equations (Bond, 2002). Further, when we are not willing to assume that the level of the X_{it} variable is uncorrelated with the individual effects (μ_i) but we are willing to assume that the first differences ΔX_{it} are uncorrelated with μ_i , the lagged values of ΔX_{it} s can be used as instrumental variables in the levels equation for period t (Arellano and Bover, 1995).

Specific to our objectives of examining the relationship between corruption and poverty and corruption and governance indicators using dynamic panel data, our paper rests on the following basic model. That is,

$$Y_{it} = \alpha Y_{i,t-j} + \beta X_{it} + \delta Z_{it} + \varepsilon_{it} \quad (3.1)$$

$$\varepsilon_{it} = \mu_i + \lambda_t + v_{it}$$

Where, Y and X are poverty or corruption, alternatively. Z represents control variables used as a mediator between poverty and corruption such as inflation, governance quality, rural population, GDP per capita growth, and gender. $i = 1, \dots, N$ is cross-section/country while $t = 1, \dots, T$ is time period. The denotations μ_i , λ_t , and v_{it} are individual effects, time effects, and disturbance term respectively.

To put it precisely, we have three models where the first two capture the relationship between corruption and poverty and the third addresses the effects of governance indicators on corruption. The third model is a general model which comprises five models. In all our models, we introduced time dummies to consider for the time effects as suggested by Islam (1998).

The first equation (equation 3.2) specifies the effect of corruption on poverty. That is,

$$Y_{it} = \gamma + \sum_{j=1}^m \alpha_j Y_{i, t-j} + \sum_{r=0}^n \beta_r X_{i, t-r} + \sum_{k=0}^q \delta_k Z_{i, t(L)} + \sum D_t + \mu_i + v_{it} \quad (3.2)$$

Where Y_{it} = poverty (human poverty index (in natural logarithm), LnHPI), $Y_{i,t-j}$ = lagged poverty (LnHPI_{i,t-j}), $X_{i,t-r}$ = corruption (corruption perception index (in natural logarithm), LnCPI), and $Z_{i,t-k}$ = a vector of other explanatory variables such as inflation (INF), GDP per capita growth rate (GDPPCGR), governance quality (GQ), rural population (in natural logarithm, LnRP), and Gender (in natural logarithm, LnGN), and D_t =time dummy. μ_i , v_{it} , i , and t are as defined before and L represents lag of the variable. The lag (L) is taken as an option to incorporate for the possibility of some of the control variables to affect the dependent variable by their lag instead of their levels. γ , α , β , and δ are coefficients; m and n are number of lags and q is a number attached to the vectors of control variables for identification.

To put it in another form, the model is defined using the variables of interest as:

$$\begin{aligned} \text{LnHPI}_{it} = & \gamma + \sum_{j=1}^m \alpha_j \text{LnHPI}_{i, t-j} + \sum_{r=0}^n \beta_r \text{LnCPI}_{i, t-r} + k_0 \text{LnRP}_{it(L)} + k_1 \text{LnGN}_{it(L)} + \\ & k_2 \text{INF}_{it(L)} + k_3 \text{GQ}_{it(L)} + k_4 \text{GDPPCGR}_{it(L)} + \sum D_t + \mu_i + v_{it} \end{aligned} \quad (3.2')$$

where all are as defined for equation (3.2).

Our second equation (equation3.3) is also similar with equation (3.2) with the exception of interchanged denotations between Y and X and exclusion of GDP per capita growth rate from vector Z.

$$\text{i.e, } X_{it} = \gamma + \sum_{j=1}^m \alpha_j X_{i, t-j} + \sum_{r=0}^n \beta_r Y_{i, t-r} + \sum_{k=0}^q \delta_k Z_{i, t(L)} + \sum Dt + \mu_i + v_{it} \quad (3.3)$$

where X and Y are corruption and poverty respectively and Z comprises a vector of all control variables indicated under equation (3.2) except GDP per capita growth rate. In another form,

$$\begin{aligned} \text{LnCPI}_{it} = & \gamma + \sum_{j=1}^m \alpha_j \text{LnCPI}_{i, t-j} + \sum_{r=0}^n \beta_r \text{LnHPI}_{i, t-r} + k_0 \text{LnRP}_{it(L)} + k_1 \text{LnGN}_{it(L)} + \\ & k_2 \text{INF}_{it(L)} + k_3 \text{GQ}_{it(L)} + \sum Dt + \mu_i + v_{it} \end{aligned} \quad (3.3')$$

where similar definition is applicable as in equation (3.2').

We specify the third equation (equation3.4) identical to equation (3.3) as a general equation designed to estimate the effect of governance indicators on corruption. We prefer to use a replica model of equation (3.3) because the reliability of our result increases if it is interpreted with in a model showing the relationship between corruption and poverty. We further derive five different equations from equation (3.4) in order to deal with the effects of each governance indicators. The general equation is specified as

$$X_{it} = \gamma + \sum_{j=1}^m \alpha_j X_{i, t-j} + \sum_{r=0}^n \beta_r Y_{i, t-r} + \sum_{k=0}^q \delta_k Z_{i, t(L)} + \sum Dt + \mu_i + v_{it} \quad (3.4)$$

where all variables are as defined under equation (3.3) but the governance quality component in vector Z is to be substituted further by each of the indicators: voice and accountability (VA), political stability and absence of violence (PSV), government effectiveness (GE), regulatory quality (RQ), and rule of law (RL). All of the five sub-equations from equation (3.4) are

identical except that the governance quality variable in the vector Z is replaced by each of the five governance indicators separately.

In an explicit form, the five equations are given as:

$$\text{LnCPI}_{it} = \gamma + \sum_{j=1}^m \alpha_j \text{LnCPI}_{i, t-j} + \sum_{r=0}^n \beta_r \text{LnHPI}_{i, t-r} + k_0 \text{LnRP}_{it(L)} + k_1 \text{LnGN}_{it(L)} + k_2 \text{INF}_{it(L)} + k_3 \text{VA}_{it} + \sum Dt + \mu_i + v_{it} \quad (3.4.a)$$

$$\text{LnCPI}_{it} = \gamma + \sum_{j=1}^m \alpha_j \text{LnCPI}_{i, t-j} + \sum_{r=0}^n \beta_r \text{LnHPI}_{i, t-r} + k_0 \text{LnRP}_{it(L)} + k_1 \text{LnGN}_{it(L)} + k_2 \text{INF}_{it(L)} + k_3 \text{PSV}_{it} + \sum Dt + \mu_i + v_{it} \quad (3.4.b)$$

$$\text{LnCPI}_{it} = \gamma + \sum_{j=1}^m \alpha_j \text{LnCPI}_{i, t-j} + \sum_{r=0}^n \beta_r \text{LnHPI}_{i, t-r} + k_0 \text{LnRP}_{it(L)} + k_1 \text{LnGN}_{it(L)} + k_2 \text{INF}_{it(L)} + k_3 \text{GE}_{it} + \sum Dt + \mu_i + v_{it} \quad (3.4.c)$$

$$\text{LnCPI}_{it} = \gamma + \sum_{j=1}^m \alpha_j \text{LnCPI}_{i, t-j} + \sum_{r=0}^n \beta_r \text{LnHPI}_{i, t-r} + k_0 \text{LnRP}_{it(L)} + k_1 \text{LnGN}_{it(L)} + k_2 \text{INF}_{it(L)} + k_3 \text{RQ}_{it} + \sum Dt + \mu_i + v_{it} \quad (3.4.d)$$

$$\text{LnCPI}_{it} = \gamma + \sum_{j=1}^m \alpha_j \text{LnCPI}_{i, t-j} + \sum_{r=0}^n \beta_r \text{LnHPI}_{i, t-r} + k_0 \text{LnRP}_{it(L)} + k_1 \text{LnGN}_{it(L)} + k_2 \text{INF}_{it(L)} + k_3 \text{RL}_{it} + \sum Dt + \mu_i + v_{it} \quad (3.4.e)$$

where all variables are as explained before.

In all of our models, we assume that $E(\mu_i) = 0$, $E(v_{it}) = 0$, $E(\mu_i v_{it}) = 0$ for $i=1, \dots, N$ & $t=2, \dots, T$.

we also assume that $E(v_{it} v_{is}) = 0$ for $i = 1, \dots, N$ & $t \neq s$. In other words, the individual effect and the error term are independent of each other and among themselves.

3.3. Estimation Method

There are different estimation methods which are often suggested for panel econometric models. Some are criticized for their weak performances while others are considered better depending on the degree of their strengths and the available remedial measures. Using OLS estimator for the estimation of dynamic panel model is both biased and inconsistent. From equations (3.2) and (3.3), $Y_{i,t-1}$ and X_{it-1} respectively are correlated with μ_i by construction while taking their lag equations. This in turn indicates that the lagged dependent variable (one of the regressors) is correlated with the error term, showing the biased and inconsistent result produced when OLS is employed for estimation.

Similarly, the standard within group or least square dummy variable (LSDV) transformation to remove the individual effects produce biased and inconsistent estimates due to the correlation between the transformed lagged dependent variable and the transformed disturbance (Baltagi, 2005; Roodman, 2006). Nickel (1981) asserts that such a bias will remain a problem especially when the time period considered is small. The within group estimator while employing orthogonal deviation transformation can only be consistent as $N \rightarrow \infty$ for fixed T if the data matrix does not contain lagged dependent variable and all the explanatory variables are strictly exogenous (Doornick, Arellano, and Bond, 2001). From Baltagi (2005), the random effects GLS estimator is also biased when applied to a dynamic panel data model.

Anderson and Hsiao (1981) considered the likelihood and the instrumental variable approach for the random effects model while Hsiao, Pesaran, and Tahmiscioglu (2002) considered the same for the fixed effect model. Anderson and Hsiao (1981) proposed two instrumental variable estimators-the difference and the level- that are found to be consistent. The estimators seem

appropriate for it eliminates the problem of correlation between the lagged dependent variable and the individual specific effects through first differencing and employment of instrumental variables.

Following Anderson and Hsiao (1981), we may use both the difference and level lagged values of the dependent variable ($\Delta Y_{i, t-k}$ and $Y_{i, t-k}$ where $k \geq 2$) as an instrumental variables since they will not be correlated with the first difference error term. In other words, the lagged values of the dependent variable Y_{it} dated $t-2$ and earlier can be used as instruments for the first difference equation. This estimator, however, is not without limitation. Arellano (1989) shows that the estimators that use differences as instruments (alike the Anderson-Hsiao) suffer from problems of singularities as well as large variances. Recent studies (Arellano and Bond (1991), Arellano and Bover (1995), Ahn and Schmidt (1995), and Blundell and Bond (1998)) argue that though the Anderson-Hsiao estimator solves the problems that cross-sectional estimators have when used with dynamic panel data, it is inefficient and does not use all the available instruments.

Based up on the innovation of using instrumental variable by Anderson and Hsiao, researchers have developed more efficient estimators. Arellano and Bond (1991), Arellano and Bover (1995), Blundell and Bond (1998), and Ahn and Schmidt (1995), among the many others, suggested the Generalized Method of Moment (GMM)⁶ framework to derive estimators that surmount the problems of Anderson-Hsiao. The key intuition behind the GMM method is that the panel structure of the data provides a large number of instrumental variables in the form of lagged endogenous as well as exogenous variables. It is generally known that using many instruments can improve the efficiency of various IV and GMM estimators (Blundell and Bond,

⁶ The general name 'GMM' in this study refers to either Difference GMM or System-GMM unless defined.

1998). The GMM estimators are more efficient than the Anderson-Hsiao estimators because they use additional instrumental variables that the Anderson-Hsiao neglects.

Hsiao and Tahmiscioglu (2007) also recommend GMM estimators for dynamic panel data model showing that the method is applicable with the presence of either random or fixed individual- and time- specific effects and is consistent and asymptotically normally distributed whether N or T or both tend to infinity. Among the GMM estimators, the Difference GMM (DIFF-GMM) and System GMM (SYS-GMM) are common for use. These estimators are designed for short wide panels and to fit linear models with a dynamic variable, additional controls, and fixed effects.

To deal with GMM estimation, let's consider our equations with all the assumptions stated. We further assume that the initial condition Y_{i1} for equation (3.2) and X_{i1} for the remaining equations are predetermined meaning $E(Y_{i1}v_{it}) = 0$ or $E(X_{i1}v_{it}) = 0$ for $i = 1, \dots, N$ & $t = 2, \dots, T$. X_{it} in equation (3.2) and Y_{it} in all other equations are endogenous in a sense that they are correlated with V_{it} and earlier shocks but uncorrelated with V_{it+1} and subsequent shocks. This implies that taking first differences introduces moment conditions $E(X_{i,t-s} \Delta V_{it}) = 0$ for equation (3.2) and $E(Y_{i,t-s} \Delta V_{it}) = 0$ for each of other equations for $t = 3, \dots, T$, $s \geq 2$, & $k \geq 2$, in addition to the $1/2 (T-1)(T-2)$ moment restrictions in the no endogenous variable case. Therefore, while taking the first-differenced GMM estimator the lagged values of endogenous regressors dated $t-2$ and earlier can be used as instruments for the equations in first difference.

The GMM estimators while widely suggested for dynamic panel model are not free of limitations. They are sometimes criticized for it may produce biased estimators. The DIFF-GMM estimator which corrects for the problems associated with the cross-sectional estimators

may perform poorly in certain situations. When the time series is persistent and when the time under consideration is small, this estimator behaves poorly. Hayawaka (2005) states two sources of bias for the GMM estimator. One is the ‘weak instruments problem’ and the other is ‘the problem of many instruments’. When the lagged levels of any series are only weakly correlated with subsequent first differences, the GMM estimator has been found to have poor finite sample properties.

Again, when the number of instruments is large relative to the sample size the GMM estimator allows a tradeoff between efficiency and bias (efficiency increases and the estimator may be biased). Blundell and Bond (1998) evidenced that DIFF-GMM estimator displays large downward biases and a serious lack of precision in estimating the autoregressive parameter when it approaches to unity (or often be greater than 0.8). Alonso-Borrego and Arellano (1999) also shows that in the first differencing models the bias is sizable especially when the parameter concerning the lagged dependent variable is close to unity.

Considering these scenarios, Blundell, Bond, and Windimeijer (2000) have suggested another type of GMM estimator-SYS GMM which better resolves the problems by exploiting additional assumptions about the initial condition. In other words, SYS-GMM assume $E(\mu_i \Delta Y_{it}) = 0$ in equation (3.2) and $E(\mu_i \Delta X_{it}) = 0$ in all the remaining equations for $i=1, \dots, N$. This yields additional moment conditions $E(V_{it} \Delta Y_{i,t-1}) = 0$ for equation (3.2) and $E(V_{it} \Delta X_{i,t-1}) = 0$ for the remaining equations, for $i = 1, \dots, N$ & $t = 3, \dots, T$. The moment conditions allow the use of lagged first difference of the series as instrument for equations in level.

From the argument of ‘more instruments - more efficiency’, SYS-GMM estimator in dynamic panel model is more efficient than DIFF-GMM estimator. The system GMM combines moment

conditions for the differenced equation with moment conditions for the model in levels. The system GMM estimator despite using more instruments is less biased than the first differencing and the level GMM estimators (Blundell and Bond (1998); Hayakawa (2005); Roodman (2006)). Hayakawa (2005) especially argues that the primary reason for the system estimators to be less biased is the fact that the bias of the system GMM is composed of a weighted sum of the biases of the first differencing and the level estimators which have opposite effects.

However, the SYS-GMM estimator also has some limitations alike the estimators discussed before. For instance, Increased bias and unreliable inference may hold as a result of large number of instruments employed while using the estimator (Newey and Smith, 2004; Hayakawa, 2005). We handled this problem by conducting a Sargan-test of over identifying restrictions as suggested by Roodman (2006). In other words, the appropriateness of the instruments is checked by testing for the absence of any correlation between the instrumental variables and the disturbances (Harris et.al, 2008). When the p-value fails to reject the null hypothesis, it implies that the instruments used are appropriate for the estimation.

It is important to note that the consistency of our estimators depends on our assumption that v_{it} are serially uncorrelated. If serial correlation exists, then some of our instruments will be invalid and the moment conditions used to identify parameter may not hold. In other words, the use of lagged values (and first differences of lags) of the endogenous variable as instruments would be invalid in the presence of serial correlation. Therefore, we conduct test for serial correlation so that we judge the reliability of our estimates. Arellano and Bond (1991) provide a test for autocorrelation, AR (1) & AR (2), appropriate for linear GMM regression. If the test shows a first order autocorrelation but no second order autocorrelation, it is indicating that the instruments are valid.

In order to address the causality between corruption and poverty, the study employs Engle-Granger causality test of panel (Wald test). Engle and Granger (1969) defined causality between variables as: “a given variable Granger causes another variable if better predictions of the latter variable are obtained using lagged and current information on the former variable”. Wald test on lags of corruption in equation (3.2') and on lags of poverty in equation (3.3') is used to infer whether corruption causes poverty or poverty causes corruption.

Mathematically, Wald test on corruption from equation (3.2') is given as

$$H_0: \ln CPI_{t-1} = \ln CPI_{t-2} = \dots = \ln CPI_{t-j} = 0$$

H_A : H_0 is not true.

Where t = time ($t = 2, 3, \dots, T$),

j = no. of lags included ($j=1, 2, \dots, n$), and

$\ln CPI$ = the natural logarithm of corruption.

If the test result shows rejection of H_0 , it is indicating that corruption Granger-causes poverty where as the fail to reject result evidences that corruption does not Granger-causes poverty.

Similarly, causality test on equation (3.3') involves the hypothesis test of

$$H_0: \ln HPI_{t-1} = \ln HPI_{t-2} = \dots = \ln HPI_{t-j} = 0$$

H_A : H_0 is not true.

Where t = time ($t = 2, 3, \dots, T$),

j = no. of lags included ($j=1, 2, \dots, n$), and

$\ln HPI$ = the natural logarithm of poverty.

In this case, rejection of H_0 evidences that poverty Granger-causes corruption while the fail to reject result indicates no causality.

CHAPTER FOUR

Analysis and Results

In this section, detailed analysis about the descriptive and econometric results starting with presentation of the data is made. Descriptive analysis and system GMM results along with its economic intuitions are discussed. Causality and other diagnostic tests are also presented.

4.1. Data Presentation and Description

This section presents the summary of data used in the study and provides statistical description. The description is important in providing an insight about the distribution of the data as well as explaining some important statistical measures needed prior to the econometric analysis. The minimum and maximum values of the variables, their averages, and graphical descriptions are included.

Table 1: summary of descriptive statistics

Variable	observation	Mean	St. deviation	Minimum	Maximum
HPI	199	37.99648	10.38898	9.5	60.3
CPI	211	2.994787	1.131927	1	6.4
INF	220	11.82386	26.08144	-8.24	325
GN	230	44.02474	6.050731	27.85	53.1
RP	230	61.28565	14.10946	38.28	87.9
GQ	207	0.4063768	0.1271262	0.15	0.68
GDPPCCGR	230	2.880124	3.942682	-15.1565	22.61792
VA	207	0.4243138	0.1387945	0.163421	0.709512
PSV	207	0.406864	0.1812155	0.00294	0.724433
GE	207	0.3954295	0.1200651	0.192191	0.66144
RQ	207	0.4155254	0.1137059	0.144664	0.68116
RL	207	0.3903751	0.1325294	0.162707	0.710691

Source: own computation from the raw data.

As shown in Table 1, the human poverty index value ranges from a minimum 9.5 for Mauritius in 2009 to a maximum 60.3 for Mali in 2005. Looking at the value of the index, the average value of human poverty for the sample country is relatively higher. The average value is higher

even when compared to that of Mauritius (within the same sample). This implies that the most basic dimensions of deprivation such as short life, lack of basic education, and lack of access to public and private resources is on average severe in the sample countries.

The mean value of corruption perception index of the sample countries falls in the range of values showing the most corrupt countries of the world as per the scale of transparency international (0 showing highly corrupt and 10 highly clean). The cleanest country among the sample is with a CPI score of only 6.4 (Botswana as of 2002) while the highly corrupt (in fact of the world) is with a score of 1.0 (Nigeria as of 2001). Even the so called “less corrupt” country in the sample is not far above the international standard’s average. It is only Botswana that shows a consistent value above the international average for the whole years under consideration. These imply that the countries are more corrupt and most of transactions in them are tainted by corruption.

The calculated governance quality index (0- highly poor and 1- good quality) data reveal that the sample countries are on average below the standard average governance quality, rotating between a minimum of 0.15 and a maximum of 0.68 (Table 1). Regarding governance indicators, the sample countries show a mean voice and accountability value below the international index’s average, ranging from 0.16 for Sudan to 0.71 for Mauritius. It is only Botswana, Mali, Mauritius, Namibia, and South Africa that consistently score above the standard average (though not far). This indicates that governments in these countries are, on average, not hearing to the voices of their citizens and are not responsive to the questions of those from which they drive the authority. In other words, the participation of citizens in

selecting their governments and the freedom of expression and association in these countries is lower.

Similarly, political stability and absence of violence which proxy the probability of a government to be destabilized and overthrown by violence is high in these countries, as shown by the average index in Table 1. That is, the majority of these countries score below the international average implying higher unrest rate in these countries. The regulatory quality of governments in these countries is poor as well. The average result indicates that the ability of the governments to formulate and implement sound policies is lower, showing the maximum of only 0.68. The data reveals that only six of the sample countries register stability above the standard average while only four countries did the same in regulatory quality.

As shown in the same source, the quality of public and civil services, of their independency from political pressure, of policy implementation and the credibility of governments to their policies (as proxied by government effectiveness) in the countries are lower. The lowest of this index is experienced by Sudan in the year 2005. It is only four of the countries of our sample that consistently score above 0.5 for the entire period considered. Likewise, rule of law in these countries is very weak as only Mauritius, Botswana, Namibia, and South Africa consistently registered nearly above standard average's index. This, in other words, means that the effectiveness and predictability of judiciary in the countries is low.

Labor force participation of females in the sampled countries is not poor as reflected by the mean value of 44.02 percent. Even in a country identified as the lowest labor force participation of female, about 28 percent of the labor force is female. The fact that the average labor force participation rate of female in sample countries is not far from the international standard's

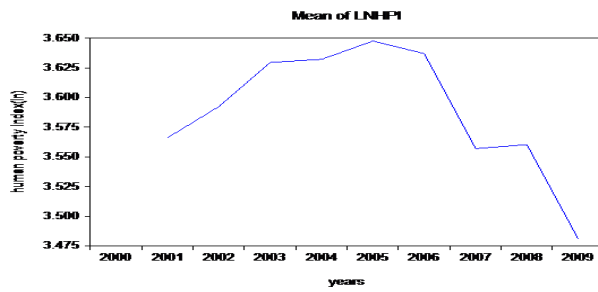
average may be considered as an opportunity to exploit the females' role in reducing poverty and combating corruption.

Inflation in the sub-region, during the years considered, ranges from a negative value (-8.24) experienced by Ethiopia in the year 2001 to a highest of 325 registered in Angola in the year 2000. High inflation puts a heavy burden on the poor than the rich; and creates a breeding ground for corruption since higher price invites agents to deliberately inflate prices of goods and services. The average GDP per capita growth rate from the summary statistics also shows that the countries have registered positive economic growth averaged to 2.88. The rate of their GDP per capita growth was mixed, some registering negative growth and others positive with highly varying trend. The fluctuation can also easily be seen from figure1 (g).

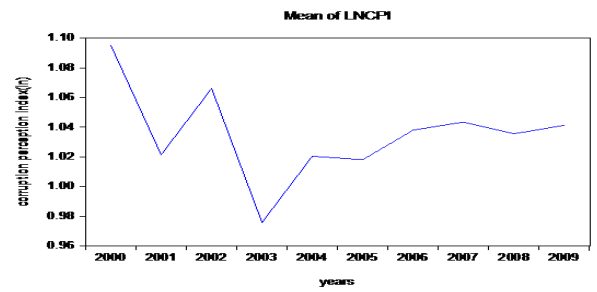
The region is also characterized by high rural population where the extreme case reaches about 88 percent. The rural population in the sample countries is on average 61.29 percent. Large rural areas is often associated with poor infrastructure facilities and less integrated groups, which in turn imply less participation of citizens in political and economic affairs. The countries are, therefore, characterized by these phenomenons which may have correlation with our variables of interest-corruption and poverty.

As shown in figure1 below (from a- g) and figure2 (in annex 3), the distribution of the variables (by their means) across periods is varying. That is, all variables (by means) except that of gender and rural population show ups and downs indicating the fluctuations over years considered. Gender and rural population exhibit consistent increase and decrease respectively.

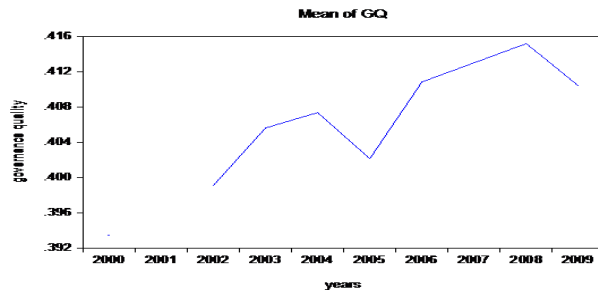
Figure 1: Distribution of the variables by their means



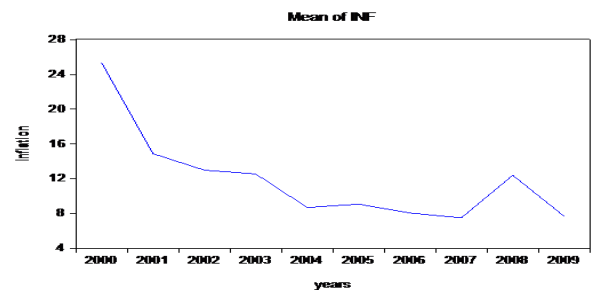
(a)



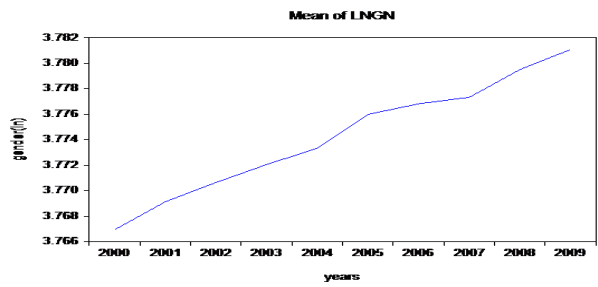
(b)



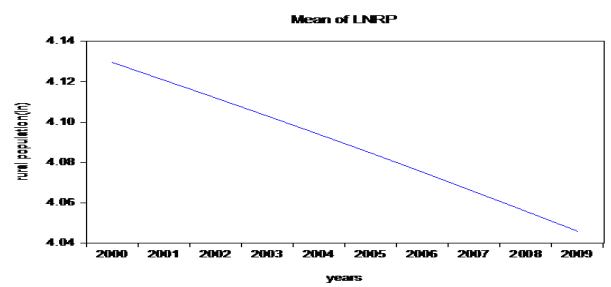
(c)



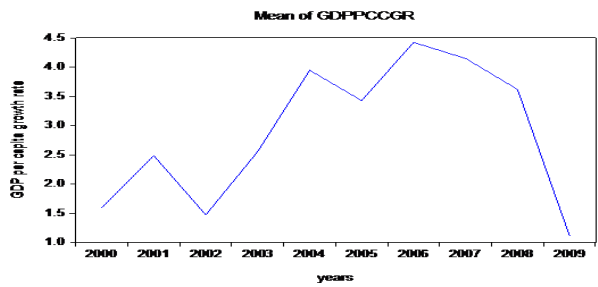
(d)



(e)



(f)



(g)

4.2. Econometric Analysis

4.2.1. Regression Results

Multicollinearity test is made prior to estimation of the results. The result from the test (annex 4) shows that there is no multicollinearity problem observed in all of our models. The empirical results of poverty and corruption equations in a notion of causality are presented in Table 2. The table shows system GMM results of corruption (model1) and poverty (model2) models designed to indicate the relationship between the variables as well as their causal link.

In model1, corruption is the dependent variable while poverty is among the independent variables. In model2, on the other hand, poverty is the dependent variable while corruption is among the independent variables. Inflation, gender (in logarithm), rural population (in logarithm), GDP per capita growth rate, and governance quality are additional explanatory variables in the models. Time dummies are incorporated in both models at least to minimize contemporaneous correlation (the likely form of unobserved cross-country correlation). Despite the inclusion of the control variables and the time dummies, our variables of interest in models one and two are poverty and corruption respectively.

Results from model1 show that corruption is significantly affected by its lag, lag of poverty, and governance quality. The persistent nature of corruption and poverty supports the reported effect of the lag of the variables. The result that poverty positively affects corruption indicates the established argument that poor people are obliged to pay additional offer (in monetary term or in kind) to enjoy their rights since they lack the capacity and power to resist corrupt acts and monitor officials (You and Khagram, 2005). The result, in addition, supports the assertion that the possibility for corruption activities to flourish and strengthen in poverty-stricken society is

higher than that of the rich economy, though the monetary amount involved is larger in the latter. Some individuals in poor economy may decide to sack undue benefits instead of generating the dues. Moreover, the deficient institutions in the poor nations make the poor (with frequent contact with the service providers) prone to corruption.

Table 2: System-GMM results of corruption-poverty model (where model1 represents corruption model and model 2 represents poverty model)

Estimated Variable	Model1(estimated coefficients)	Model2(estimated coefficients)
(Lncpi) _t		-.2181354 (.1277027) *
(Lncpi) _{t-1}	.6045649 (.0851254) ***	.0743865 (.1383905)
(Lncpi) _{t-2}	.0547957 (.0585212)	.1227841 (.1033918)
(Lncpi) _{t-3}		-.2129632 (.1057158) **
(lnhpi) _t	-.0540233 (.1201532)	
(lnhpi) _{t-1}	-.2568508 (.1172094) **	.783091 (.1139479) ***
(lnhpi) _{t-2}	.1623472 (.1217349)	-.0377213 (.1050622)
Inf	.0000576 (.0013308)	.0008983 (.0017132)
Lngn	.1936857 (.197344)	
(Lngn) _{t-3}		.116448 (.261656)
Lnrp	-.0649759 (.1142988)	
(Lnrp) _{t-1}		.1909782 (.1091927) *
Gq	.779901 (.25069) ***	
Gq _{t-1}		-.7245777 (.4185355) *
GDPpccgr		-.0002759 (.0030696)
Year dummy (2003)	-.0893816 (.0352794) **	
Year dummy (2004)	.0457631 (.0317953)	
Year dummy (2005)	.0267725 (.0243172)	.0500116 (.0323501)
Year dummy (2006)	.0403385 (.0174913) **	.0324851 (.0173531) *
Year dummy (2007)	.0317903 (.0219615)	
Year dummy (2008)		.029571 (.0161386) *
Year dummy (2009)		-.0789903 (.0415164) *
Constant	.0786551 (.823084)	-.0704367 (.0379175) *
No. of observation	139	132
No. of groups	23	23
Sargan test (p value)	0.2990	0.2706
AR(1), p value	0.0045	0.0092
AR(2), p value	0.3403	0.4737
Wald test, p-value (Ho:(lnhpi) _{t-1} = (lnhpi) _{t-2} = 0)	0.0287	
Wald test, p-value (Ho:(logcpi) _{t-1} = (logcpi) _{t-2} = (lncpi) _{t-3} = 0)		0.0495
Wald test, p-value (Ho: yr03 = yr04 = ... = yr09 = 0)	0.0029	0.0182

Figures in parentheses are standard errors. *** indicates significance at 1% level, ** indicates significance at 5% level, and * indicates significance at 10% level. Abbreviations are as defined in the acronyms section.

Governance quality is found significant (at one percent significance level) indicating the strong relationship between governance and level of corruption. The positive coefficient shows that improved governance imply lower corruption and poor governance indicate higher possibility for spread of corruption. The result is consistent with theoretical and empirical justifications that improved governance lowers corruption and poor governance creates and breeds corruption (Pillay, 2004; Kaufmann et.al, 2009).

In model2 of Table2, it is shown that the lag of poverty, level, and lag of corruption are significant at one percent, ten percent, and five percent significance levels respectively; whereas the remaining lags of both variables are found insignificant. The sign of the coefficient of corruption is negative mainly because lower values of corruption data indicates higher corruption level, as defined in the measurement nature of corruption perception index. The significance of corruption in the model reveals that corruption has an impact of aggravating poverty. In an economy where provision of services is tainted by corruption poor people are often marginalized from the services and incase they decide to pay rents it is at the expense of their other best alternative uses. The poverty levels in SSA countries have shown less improvement (UNDP-HDRs) for the past years may be because of the adverse effect of rampant corruption in the region. This finding is in line with those of Gupta et.al (1998), Razafindrakoto and Roubaud (2007), and Dincer and Gunalp (2008).

Both governance quality and rural population are found significant at 10 percent significance level (model2). Governance quality negatively affects poverty, meaning improved governance helps to reduce poverty. Poor people warmly need a system which gives them equal opportunity in accessing services. Improving governance, therefore, is creating this system which energizes

the poor in getting out of poverty. On the other hand, the likelihood of increasing poverty is higher among the rural population since rural area is often characterized by poor infrastructure and is marginalized from other facilities necessary to reduce poverty. These results are consistent with the finding in Haughton and Khandker (n.d). The variables gender, inflation, and rural population are found insignificant in model1 while the former two variables and GDP per capita growth rate are found insignificant in model2.

The separate impact of the five governance indicators on corruption is analyzed using a separate regression shown in table3. This is made to identify the power of each governance indicators in explaining the problem of corruption, especially in a model explaining the causal effect between poverty and corruption. Such an analysis also helps to identify the indicator with the most powerful impact and lay foundation to identify the area of attention (among the governance indicators) in combating corruption.

To consider the independent effect of each governance indicator, five regressions are run on corruption model represented by equation (3.4) in chapter three. Model (a) represents corruption model where governance quality is represented by voice and accountability (VA). Model (b) is the same model where political stability and absence of violence (PSV) denotes governance quality. Similarly, models (c), (d), and (e) are corruption models where government effectiveness (GE), regulatory quality (RQ), and rule of law (RL) respectively are exclusively the variables of interest.

Results from model (a) show that voice and accountability positively and significantly (at One percent significance level) affects corruption indicating that lack of transparency and accountability prepares a breeding ground for corruption and negatively affects the efforts of

combating corruption. This shows that the extent to which a country's citizens are able to participate in selecting their government and the degree of freedom of expression and association significantly affects the level of corruption in a country. In other words, improved accountability which is imperative to make public officials answerable to government behavior and responsive to the entity from which they derive their authority has the capacity to lower corruption.

Table 3: System GMM results for the five separate regressions of corruption model (in each model the dependent variable is corruption).

Estimated variables	Coefficients and standard errors from each model regression				
	Model (a)	Model (b)	Model (c)	Model (d)	Model (e)
(lncpi) _{t-1}	.5424(.0975)***	.6944(.0968)***	.6714(.1090)***	.5675(.0834)***	.6604(.0852)***
(lncpi) _{t-2}	.1149(.05949)*	.0591 (.0602)	.0551(.0671)	.0474(.0669)	.0149(.0559)
(lnhpi)	-.0198 (.1042)	.0090(.1059)	-.0576(.0978)	-.1309(.1199)	-.0409(.0959)
(lnhpi) _{t-1}	-.2458(.1200)**	-.2602(.1185)**	-.2575(.1148)**	-.1414(.1277)	-.2767(.1190)**
(lnhpi) _{t-2}	.0517 (.1493)	.0623(.1217)	.1852(.1268)	.1554 (.1136)	.1892(.1119)
(lngn)	.3369(.2255)	.2091(.1779)	.1985(.2025)	.2424(.2003) *	.1895(.1729)
(lnrp)	-.1105 (.1172)	-.0689(.1004)	-.0243(.1149)	-.0823(.0951)	-.1178(.0891)
Inf	.00067 (.0015)	.000005(.0010)	-.0003(.0011)	.0003(.0011)	-.000003(.0016)
VA	.7287(.2663)***				
PSV		.2343(.1157)**			
GE			.4321(.2114)**		
RQ				1.170(.2998)***	
RL					.6746(.2442)***
Timedummy(2003)	-.0941(.0326)***	-.0987(.0459)**	-.1101(.0371)***	-.0822(.0294)***	-.0999(.0327)***
Timedummy(2004)	.0237 (.0354)	.0365 (.0388)	.0332(.03566)	.0409(.0269)	.0450(.0351)
Timedummy(2005)	.01887(.0263)	.0145 (.0256)	.0182(.0216)	.0306(.0213)	.0159(.0255)
Timedummy(2006)	.02698(.0220)	.0328 (.0187)	.0393(.0168)**	.0419(.0151)***	.0377(.0188)
Timedummy(2007)	.0264(.02207)	.0332(.0211)	.0216(.0203)	.0258(.0199)	.0243(.0228)
Constant	.1678(.7729)	.3165 (.6404)	-.0849(.6675)	-.2755(.3761)	.2807(.7164)
No. of observation	139	139	139	139	139
No. of groups	23	23	23	23	23
Sargantest(p-value)	0.1842	0.1290	0.1210	0.3145	0.3011
AR(1), p-value	0.0025	0.0053	0.0021	0.0035	0.0034
AR(2), p-value	0.6830	0.3941	0.3424	0.3335	0.1649
Wald test, p-value (Ho:yr03=yr04= ... =yr09=0)	0.0044	0.0145	0.0003	0.0000	0.0015

Numbers in parenthesis are standard errors. *, **, and *** indicate significance at 10%, 5%, and 1% levels respectively. Abbreviations are as defined before.

Political stability and absence of violence also affects corruption significantly at five percent significance level (model (b) in Table3). It is found that an economy with no violence and characterized by political stability have low corruption and vice versa. This implies that in a situation where the likelihood of the government to be destabilized and overthrown by unconstitutional and violent means is higher, corrupt activities increase.

Government effectiveness which proxies the quality of public services, the quality of civil services, the degree of their independence from political pressure, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies is found to have significant impact on corruption. The result from model (c) shows a five percent significant positive coefficient of government effectiveness. This implies that improved effectiveness by government contributes to lower corruption while poor effectiveness contributes in bringing rampant corruption.

As indicated in Table 3 (model d), poor regulatory quality of the government has the capacity to increase corruption. The effect is significant at one percent significance level signifying that poor ability of the government to formulate and implement sound policies can contribute to the problem of corruption. Likewise, good regulatory quality by government helps to close ways to spreading corruption. The extent to which agents have confidence in and abide by the rules of the society also has significant effect on corruption (model e). Rule of law that measures the enforceability of contracts as well as the effectiveness and predictability of the judiciary affects corruption significantly (at one percent significance level). In a case when the rule of law is weak, corruption increases while strong rule of law limits expansion of corruption. The result

that voice and accountability, Regulatory quality, and rule of law independently show very strong significance indicates that these variables explain corruption more, among the others.

The results from Table 3, in general, provide empirical evidence that the five governance indicators are among the main contributors to the problem of corruption. In addition, our result develops the opposite look against the theories presented by chetwynd et al (2003) that corruption affects poverty through its impact on governance factors. In their classification of models about the link between corruption and poverty, their “governance model” postulates that corruption affects poverty by first influencing governance factors. Our finding, on the other hand, evidenced that the governance factors also affect corruption, without denying the possibility of their assertion.

4.2.2. Causality Results

Causality tests are conducted to identify whether unidirectional or bidirectional causality exists between corruption and poverty. The test of whether one variable Granger-causes another variable consists of a test of the hypothesis that the coefficients of current and lagged values of the former variable are jointly equal to zero (Wald test) after controlling for the latter variable’s own lags and the influence of additional controls.

To test whether corruption Granger-causes poverty, the coefficients of lags of corruption (from model2) are tested jointly employing Wald test. The null hypothesis that corruption does not Granger-cause poverty (the coefficients are jointly equal to zero) is tested against the alternative that at least one of them is different from zero (causality exists). The Wald test result from model 2 in Table 2 rejects our null hypothesis of no causality. This indicates that corruption

Granger-causes poverty which in turn means that current and past information on corruption helps to improve prediction of poverty. Similar findings are reported by Negin et.al (2010) and Dincer and Gunlap (2008) in the context of their respective areas of study.

Similarly, the null hypothesis that the coefficients of lagged values of poverty (in model1 of Table2) are jointly equal to zero is tested against the alternative that at least one of them is different from zero. The Wald test, again, rejects the null hypothesis of no causality showing that poverty also Granger-causes corruption. In other words, current and past information on poverty helps to improve the prediction of corruption. The causality test result of our study, therefore, implies that corruption and poverty have bidirectional causality running both from corruption to poverty and from poverty to corruption⁷.

4.2.3. Diagnostic Tests

Three types of diagnostic test are used to determine the validity of our empirical models. These tests include the Sargan test of identifying restrictions, autocorrelation test, and significance tests of the included time dummies. The tests are reported at the lower end of each table corresponding to each model. The Sargan test of identifying restrictions under the null hypothesis of the validity of instruments (Roodman, 2006) examines the quality of specification of the model and the appropriateness of the instruments used. When interpreting the Sargan test statistic, the high p-value indicates the fail to reject of the null-hypothesis of the validity of no over identification restrictions. For all models, a high p-value of Sargan test statistics is observed and hence the null hypothesis fails to reject. This shows that all specifications are well specified and that the instruments are appropriate.

⁷ Test results can be referred from table2 corresponding to each model.

The second test is an autocorrelation test for the presence of serial correlation in the first differenced residuals of first and second order. Arellano and Bond (1991) proposed this test to examine the null hypothesis that the residual from the estimated regressions is first-order correlated but not second-order correlated. The test results of first-order autocorrelation (AR (1)) reported in tables 2 & 3, particular to each models, show that the null hypothesis of no autocorrelation is rejected as the p-values exhibits significance.

The test results of the second-order autocorrelation (AR (2)) from all models, on the other hand, fails to reject the null hypothesis of no autocorrelation as indicated by higher p-value. The absence of serial correlation shows the differenced residuals by significant negative first-order serial correlation and no second order serial correlation. In other words, the fact that the first differenced error terms exhibit first-order serial correlation does not imply the correlation of the instruments with the error term; rather, the true serial correlation is reflected by the p-value of second-order autocorrelation statistics (AR(2)). In line with this, the observed high p-value results of AR(2) in all of our models reveal that the instruments used in all models are independent of the error term and hence appropriate for the estimation.

Finally, the joint significance test for time dummies is tested to examine the validity of the time dummies considered in each models. The null hypothesis that the coefficients of all the time dummies considered are jointly equal to zero is tested against the alternative that they are not. Results from all models show rejection of the null hypothesis and that the time dummies are found relevant and appropriate for the estimation.

CHAPTER FIVE

Conclusions and Implications

In this section, the conclusions followed from the results of the study and the possible implications are presented. The implications include both the policy options and possible future research agendas that are expected to solve (at least minimize) the problem.

5.1. Conclusions

This paper studies the relationship between corruption and poverty, corruption and governance indicators, and the causal link between the former. In order to achieve the objectives, data for 23 sub-Saharan African countries over the years 2000 – 2009 are used in a dynamic panel model (using SYS-GMM estimator). The result from multicollinearity test conducted prior to other econometric analysis shows no multicollinearity problem in all of our models.

The estimation results show that the relationship between corruption and poverty is bidirectional, meaning corruption has a statistically significant effect on poverty and poverty also has a significant effect on corruption. Causality test results also show that bidirectional causality exists between them. It is shown that corruption Granger-causes poverty, and poverty also Granger-causes corruption. This indicates that the severity of one may increase unless the other is carefully managed.

Governance quality also has a significant effect on both corruption and poverty. Good governance limits corruption and helps to reduce poverty while poor governance brings a breeding ground for corruption and increases poverty. Higher rural population which is characterized by underdeveloped facilities also exerts negative pressure on poverty.

The coefficients from the estimation results of models showing the relationship between governance indicators and corruption show that each of the governance indicators affects corruption significantly. Voice and accountability is highly significant indicating that listening to the voices of citizens and making decisions explicable decreases the probability for corruption. Similarly, sound rule of law limits the spread of corruption. Political instability and violence also positively contributes to the problem of corruption since the high probability of a government to be overthrown by unconstitutional and violent means strengthen the reluctance of corrupt officials to work in a justice/fair environment.

If the capacity of the government to formulate and implement sound policies is weak, corruption flourishes. Likewise, the significant coefficient of government effectiveness indicates that the quality of civil services, public services, and their independence from political pressure matters in efforts towards combating corruption. Poor quality of the services is associated with increased corruption and vice versa.

In a nutshell, corruption and poverty have a significant relationship with bidirectional causality running in both directions. For both corruption and poverty, governance matters. Voice and accountability, regulatory quality, rule of law, political stability and absence of violence, and government effectiveness independently and significantly affects corruption. This, therefore, adds to the literature that governance factors affects poverty may be through their impact on corruption and hence on economic factors.

5.2. Implications

In line with our objectives and results, we imply the following options so that the problems will safely be handled.

The significance and bidirectional causality between corruption and poverty necessitates the need to develop pro-poor anti-corruption strategies. Poverty alleviation strategies of a country should also be within a framework of laying corruption-free channels of implementing the strategies. Since the causality is running from both directions, governments have to put ‘combating corruption’ and ‘poverty reduction’ simultaneously among their priorities. Due attention, also, has to be given to improving the quality of governance while working towards poverty alleviation and combating corruption. The stakeholders should not treat poverty alleviation and combating corruption as different strategies, rather it has to be treated as integral components of the same strategy.

The specific policy options that we suggest as a remedy include: one, increasing transparency. Creating transparent system fosters accountability which together promotes inclusiveness, where all citizens including the poor gets access to participate in both political and economic affairs. Second, enhancing implementation which involves making the government effective and increasing its regulatory quality. When agents, principals, and citizens abide by the rule of law and are empowered according to their level of professional competence, failure of policies decline and incase it do so the system punishes a responsible. Finally, developing commitment by government (or the leading political party in a country) is crucial in recognizing the existence of the problem, understanding its severity and impacts, and in effectively implementing both political and economic solutions.

In addition to the above implications, we suggest further research in the same area using data for each country. The correlation and causal linkage between corruption, governance, and poverty, particular to a country, are better understood (derived) if country specific studies are made. In other words, implications for a policy and others for a country are sounder if they are the outcome of the investigations in that specific country.

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Annexes

Annex 1: List of Sample Countries

Angola	Mauritius
Botswana	Mozambique
Cameron	Namibia
Congo, Rep.	Nigeria
Cote d'Ivoire	Senegal
Ethiopia	Sierra Leone
Gambia	South Africa
Ghana	Sudan
Kenya	Tanzania
Madagascar	Uganda
Malawi	Zambia
Mali	

Annex 2: Description of Variables and Source

Variable	Description	Source
Human Poverty Index	A percentage figure indicating the denial of choices leading to tolerable life.	UNDP-HDR (Annual)
Corruption Perception Index	The perceived level of corruption as determined by expert assessment and opinion survey	TI (Annual)
Inflation	Consumer price index	WDI (2010)
Gender (Female labor force participation)	The percentage of female labor force out of the total labor force	WDI (2010)
Rural Population	Percentage of rural population out of the total	WDI (2010)
GDP per capita Growth rate	Growth rate of Gross Domestic Product accounted for number of population	WDI (2010)
Governance Quality	The quality of the traditions and institutions by which authority in a country is exercised	World Bank Governance database
Voice and Accountability	Perceptions of the extent to which a system is responsive	World Bank Governance database
Political Stability and Absence of Violence	Perceptions of the likelihood of instability and violence	World Bank Governance database
Government Effectiveness	Perception of the quality & independence of public & civil services including policy formulation, implementation, & credibility	World Bank Governance database
Regulatory Quality	Perceptions about the ability of the government to formulate & implement sound policies and regulations	World Bank Governance database
Rule of Law	Perception about the confidence of agents in the rule of society and abide by it	World Bank Governance database

Annex 3:

Figure 2: Distribution of governance indicators by their means

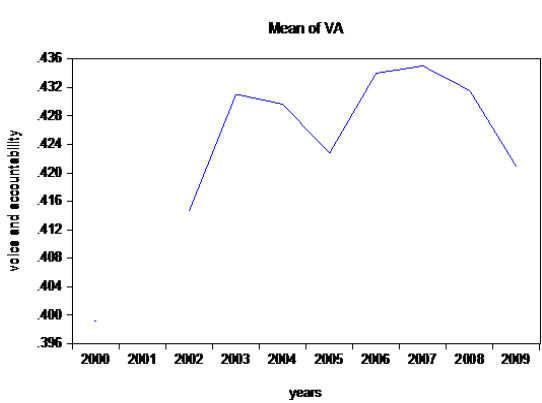


fig (i)

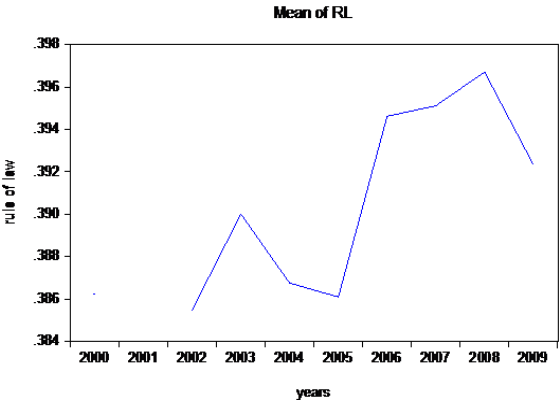


fig (ii)

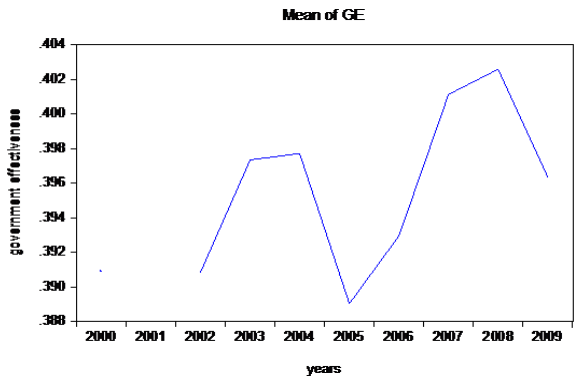


fig (iii)

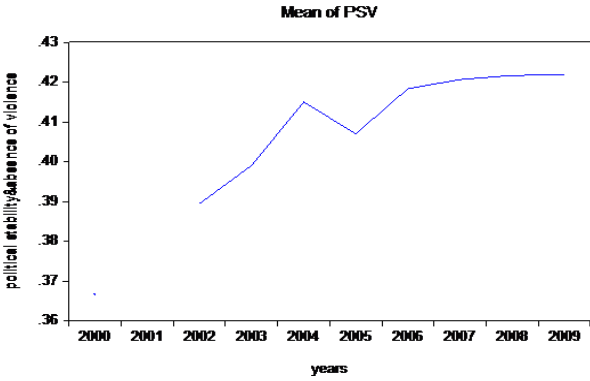


fig (iv)

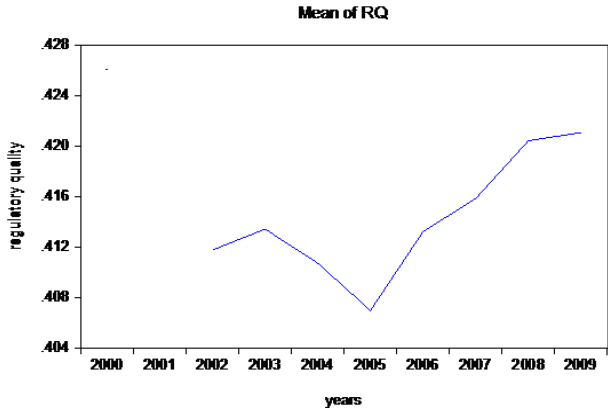


fig (v)

Annex 4: Correlation Results

	lnhpi	lncpi	lngn	lnrp	inf	gq	gdppccgr	va	psv	ge	rq	rl
Lnhpi	1											
Lncpi	-0.364	1										
Lngn	0.251	0.243	1									
Lnrp	0.225	-0.146	0.235	1								
inf	0.086	-0.099	0.195	0.057	1							
gq	-0.409	0.754	0.318	-0.068	-0.121	1						
gdppccgr	0.102	-0.017	0.058	0.035	0.094	-0.061	1					
va	-0.369	0.789	0.258	-0.014	-0.108	0.940	-0.067	1				
psv	-0.271	0.719	0.419	-0.146	-0.079	0.891	-0.019	0.789	1			
ge	-0.463	0.837	0.229	-0.118	-0.093	0.931	-0.036	0.864	0.713	1		
rq	-0.434	0.807	0.235	-0.037	-0.180	0.921	-0.124	0.867	0.69	0.920	1	
rl	-0.413	0.832	0.265	0.013	-0.116	0.958	-0.048	0.859	0.825	0.902	0.877	1

Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university, and that all source of materials used for the thesis have been duly acknowledged.

The examiners' comments have also been duly incorporated.

Declared by:

Name: Abraham Seyoum Gonfa

Signature: _____

Date: _____

Confirmed by:

Name: _____

Signature: _____

Date: _____

Place and date of submission: _____