NEXUS BETWEEN CORRUPTION, GOVERNMENT EXPENDITURE AND ECONOMIC GROWTH IN EAST AFRICAN COMMUNITY MEMBER STATES

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University or any other award.

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DEDICATION

This thesis is dedicated to my family: my dear wife Ruth, my children; Nicole, Bravel, Gracel and Einstein

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ABBREVIATIONS AND ACRONYMS

CC	Control of Corruption index
CPI	Corruption Perception Index
MRW	Mankiw Romer and Weil
EAC	East Africa Community
GDP	Gross Domestic Product
SGMM	System Generalized Method of Moments
IIAG	Ibrahim Index of Africa Governance
MOI	Mo Ibrahim Index
OECD	Organization for Economic Co-operation and Development
TI	Transparency International
SDGs	Sustainable Development Goals
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
WGI	World Governance Indicators

OPERATIONAL DEFINITION OF TERMS

A Corruption Indicator: A measure that points out or assesses something about the state of governance or about a particular aspect of corruption in a country such as control of corruption, corruption perception and Mo Ibrahim accountability (corruption) indices.

Control of Corruption: Reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

Corruption Perception Index: A corruption rank of countries/territories by Transparency International based on how corrupt the country is perceived to be. It is a composite index, a combination of surveys and assessments of corruption, collected by a variety of reputable institutions. It is ranked 1-100 where 1 is the most corrupt country and 100 is the least corrupt country.

Corruption: Assessment based on the opinions and perceptions of country level of public sector accountability, transparency and abuse of public office or public position for private gain. The assessment is based on corruption indicators.

Mo Ibrahim Accountability Index: A corruption measure of countries by Mo Ibrahim based on how corrupt the country is perceived to be. It is a composite index, a combination of surveys and assessments of corruption, collected by a variety of reputable institutions. It is ranked 1-100 where 1 is the most corrupt country and 100 is the least corrupt country.

Rent Seeking: An action by individuals to fraudulently get economic gains, that is, obtaining the share that is paid over the market price to the factor of production so as to maintain its employment in its current state.

ABSTRACT

The pursuit of sustainable economic development amidst corruption has become a fundamental challenge for most economies globally and East African Community states are not exceptional. East African Community states are ranked among the most corrupt countries globally. The region is characterised with ever increasing government expenditure, high fiscal deficits and retarded economic growth. Individual countries in the region have failed to attain and sustain an average of 7% per capita economic growth rate to fast-track the set Sustainable Development Goals and African agenda 2063. This necessitated a study to investigate the nexus between corruption, government expenditure and economic growth in East Africa Community states using the three indicators of corruption. Specifically, the study established the determinants of corruption, effect of corruption on government expenditure and economic growth in East African Community states. The study employed non-experimental research design using extended Becker theory of crime and Augmented Solow model of growth. In establishing the nexus, the study employed system generalized methods of Moments estimation technique. The results revealed that corruption is determined by the following variables: economic growth, government effectiveness, capital formation, Gini index, inflation, political stability, human capital and political stability. The study confirmed that for all corruption indicators there was a positive relationship between corruption and government expenditure. A positive affiliation between government expenditure and economic growth was also established. To establish a nexus between corruption and economic growth, all corruption indicators showed a negative liaison. It is thus recommended that respective East Africa Community states should promote and implement institutional reforms such as reforming the entire justice systems to ensure government effectiveness, rule of law and enhanced accountability. They region Governments should not only establish independent agencies to monitor and track government expenditures, but also put in place prudent fiscal policy measures that promote stable and high-rate of economic growth.

CHAPTER ONE

INTRODUCTION

This section outlines the background, statement of the problem, research questions and objectives of this study. It also presents the significance and scope of the study.

1.1 Background of the Study

The history of corruption in Africa reveals that at the time of independence, the vice of corruption through abuse of public office for private gains had been limited to middle level public officials. However, the problem has since spread to all echelons of society (World Bank, 1997). Hope (2014) and Kanakulya (2015) acknowledge that corruption is entrenched in public institutions and politics, to the point that it is the norm to give bribes during elections. Rent seeking by officers in public service for individual benefit has characterised most of the developing nations. Some public official(s) accept, solicit, or extort bribes before delivering service that they are under obligation or duty to do or not to. Aidt, Dutta and Sena (2008) observe that some public officers exercise patronage and nepotism where theft of state assets or diversion of state resources occurs.

Globally, corruption has in recent times received broad attention from researchers, policy makers, international organizations and governments. For example, United Nations (2015) adopted the United Nations Convention against corruption, criminalization and seeking international co-operation making it the first legally binding global instrument to fight corruption. According to Eigen (2001) and World Bank (2013) corruption is a daunting hindrance to sustainable development, education, health care and poverty reduction. It is a great impediment to the

Sustainable Development Goals (SDGs) and is one of the main factors that has prevented poor and developing countries from catching up with their developed counterparts (Gray & Kaufmann, 1998).

There are two conflicting schools of thought on corruption. One school of thought supported by Mauro (1995) and Tanzi and Davoodi (1997) argues that corruption has negative effects (sands the wheels) on long-term sustainable economic development. On the other hand, it is claimed that corruption deteriorates and affects the economic growth path (Ackerman, 2006; Ryvkin & Serra, 2012; Seka, 2013). They indicate the various ways through which corruption is an impediment to economic growth and performance. First, corruption affects the productivity and hence the efficiency of the public sector negatively. Public resources are allocated, distributed and even invested directly to the sector with highest private gains for instance, military expenditures and large-scale construction projects (Gupta, De Mello & Sharan, 2001; Kaufmann, 1997; Tanzi & Davoodi, 2002a, 2002b).

Second, corruption distorts human capacity inputs to development, occupation and their entire mind-set. The citizenry adjusts the belief that public sector has higher returns through corrupt deals and it lowers the incentive to work in private business or sector (Acemoglu & Verdier, 2000; Shleifer & Vishny, 1993). Third, corruption raises the cost of business and this lowers the level of efficiency in the area and private business maybe crowded out (Guetet, 2006; Gyimah-Brempong & de Camacho, 2006; Johnson, Kaufmann & Shleifer, 1997). Lastly, returns that corporate sectors expect reduce because corruption affects entrepreneurship, innovation, technological applicability and the efficiency of human capital (Choudhary, 2011; Healy &

Ramanna, 2013; Knight, 2013; Lambsdorff, 2006; Mlambo, 2005;Pepukayi, David, Evelyn, & Amandeep, 2015; Ryvkin and Serra, 2012; Wei, 2000;).

According to Salinas-Jiménez (2011) corruption conditions the efficiency levels of the economies and their total factor productivity (TPF) growth rate. In particular, Orayo & Mose (2016) reiterate that rent seeking activities result in low levels of employment, high cost of goods and services as producers pass the cost of corruption to consumers resulting in reduced consumption and overall poor economic performance. It is in this light that a better understanding of the complex ethical concerns and social impact of corruption is required while pursuing development activities.

The second school of thought was fronted by Bardhan (1997) and Leff (2002) who argued that corruption can grease the wheels of growth in the presence of weak regulatory frameworks, government inefficiency and result to increase in economic growth. The government official for example, may facilitate the clearance of foreign direct investment (FDI), by overcoming government bureaucracy hence facilitating the state activities which may lead to economic growth. Further, government officials may allocate more resources to perceived sectors in return of bribes hence increasing government expenditure. However, Leff (2002) claimed that there is no evidence of any economy in the world which has grown based on enhanced corruption.

Considering the regional blocs, East Africa Community (EAC) states have in the past decade set side immense resources in tackling corruption through establishment of key institutions of governance but with little gains on economic growth rates (Orayo & Mose 2016). This begs the question; do these reform(s) suggested and implemented give returns that are commensurate to the funding.

Both Tindifa (2009) and Transparency International (2017) assert that corruption has reached insurmountable levels; it appears to be institutionalised, despite the efforts by governments in the EAC region to curb corruption. An empirical investigation into the main determinants of corruption, its effect on government expenditure and economic growth is essential.

1.1.1 Overview of Corruption in EAC States

According to Orayo and Mose (2016) all EAC member states have been through turbulent conditions at different times in their history that have greatly impacted their economies. Corruption is one of the causes of economic turbulence and has been developing in complexity due to globalisation and technological advancement (Tindifa, 2009; Hope, 2014). Since early 1990s, countless and huge efforts by international, regional and national bodies have been put in place to minimise and eventually eradicate corruption since it is considered as one of those unethical deportments that negatively affect the realization of sustainable development in the regional bloc (Transparency International, 2016; 2017). In the recent past, there has been a growing concern over the rising levels of corruption in public sector and its impact in social as well as economic development in EAC states.

Corruption measurement serves as a means of assessing and evaluating the viability tool for FDI in developing countries. Despite increased arguments that corruption is a variable that cannot be measured precisely, United Economic Commission for Africa (2016) highlights a number of indices that have been adopted over the years to explain the status of corruption, and give awareness among policy makers and general public. These indices include African Governance (Mo Ibrahim index, Global Corruption Barometer and Global Integrity Index) as well as Corruption Perceptions Index

(Transparency International) and the Worldwide Governance Indicators (the World Bank).

These are perception based indicators as opposed to fact-based indicators concentrating on Africa. This could be due to the unavailability and unreliable constructed data in developing countries. This study, therefore, employs all indices including Mo Ibrahim accountability index which ranks states on a scale of 1 (1 percent) indicating highly corrupt to 10 (100 percent) indicating corruption Free State). Mo Ibrahim accountability index looks at corruption and bureaucracy, transparency and corruption in the public sector, prosecution of those who misuse public office, misallocation of public funds and access to information aggregated to produce the accountability index under the Mo Ibrahim governance Index for African countries. This index allows broader country coverage than individual ones; it summarizes many indicators and gets average, which further reduces measurement errors as well as bias that arise from individual sources. This indicator is also sourced from Africa and therefore backed up by empirical data from the African countries (UNECA, 2016). Figure 1.1 shows corruption trends as determined by Mo Ibrahim Index of Africa Governance (IIAG).

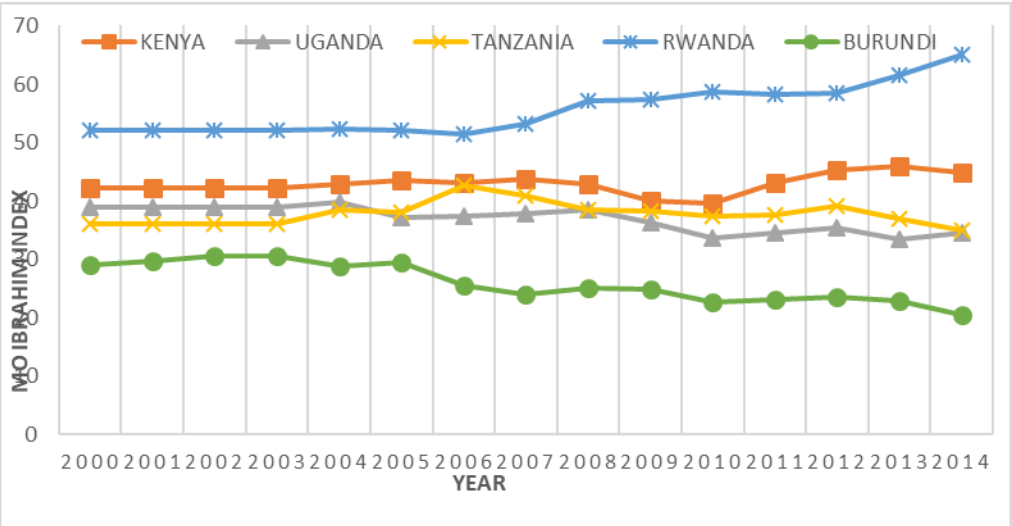

Figure 1.1: Trends of Corruption Levels (Ibrahim Index) in EAC States (2000-2014)
Source: Author using Mo Ibrahim Index

Figure 1.1 shows corruption trends, which measures corruption from year 2000 to 2014. As it can be observed, Rwanda is ranked highest at above 50 percent (2006-2014) implying that the corruption level in the country was low compared with Burundi, which was ranked extremely low over the same period at less than 30 percent indicating high corruption. Kenya, Uganda and Tanzania, however, maintained between 36 percent and 43.5 percent between the year 2000 and 2006. Between 2007 and 2014, these three countries fluctuated between lows of 35 percent and highs of 44.8 percent. On the other hand, Rwanda did well between 2007 and 2014 where it rose from 53.1 percent to 65.1 percent implying reduced corruption levels. Burundi marginally declined from 24.1 percent to 20.6 percent implying increased corruption levels. Among the five states, only Rwanda surpassed the 50 percent mark. It is followed by Kenya, Uganda and Tanzania in that order.

The second corruption indicator considered in this study is the Worldwide Governance Indicators by the World Bank. Control of corruption is basically

concerned with the use of public positions for private gain including petty and grand corruption, as well as the elite engaging in private interests taking the state hostage (Orayo & Mose, 2016). According to World Bank, control of corruption is measured on a scale of -2.5 indicating highly corrupt state and 2.5 showing less corrupt state.

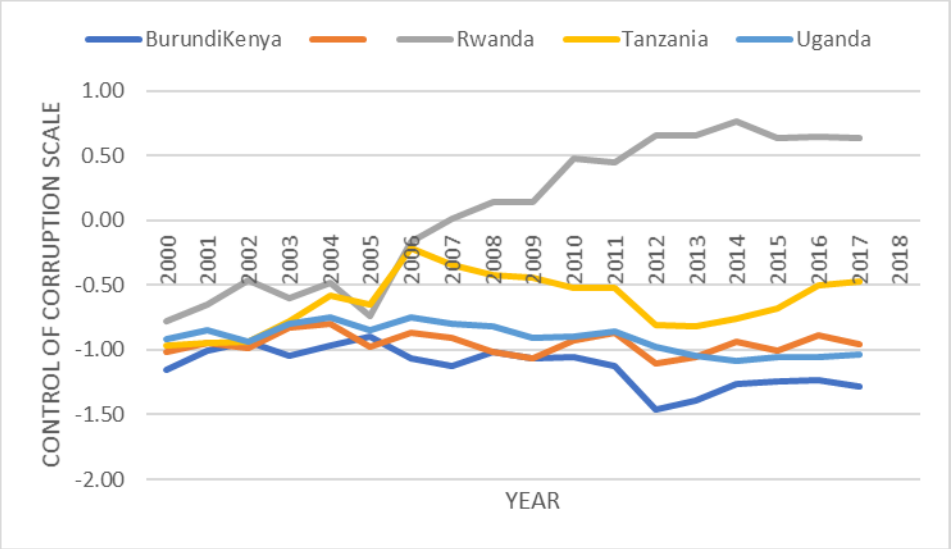

Figure 1.2: Worldwide Trends on Governance Indicators (Control of Corruption)
Source: Worldwide Governace Indicators (Control of Corruption)

Following the trends obtained in figure 1.2, almost the entire period (1996-2017) most countries were recording a below zero value for control of corruption. In this case therefore, all East Africa states between 1996 and 2007 were ranked poor in terms of controlling corruption with Burundi, Kenya and Uganda being the poorest as they were operating between -0.8 and -1.45 throughout the study period. Measures taken to curb corruption in Rwanda made it the only country in East Africa, from the year 2007, that was rated positive in terms of controlling corruption with lows of zero and highs of approximately 0.76. Generally, it can be observed that from the year 2006 to 2012, Tanzania, Kenya, Uganda and Burundi showed a drastic drop in controlling corruption.

The third measure is Corruption Perceptions Index (CPI) as suggested and computed by Transparency International which qualifies corruption through its annual publication of the CPI. Heywood and Rose (2014) argued that CPI raises the

awareness and shows the extent of corruption in the country. It is ranked 1-100 where 1 is the most corrupt country and 100 is the least corrupt country.

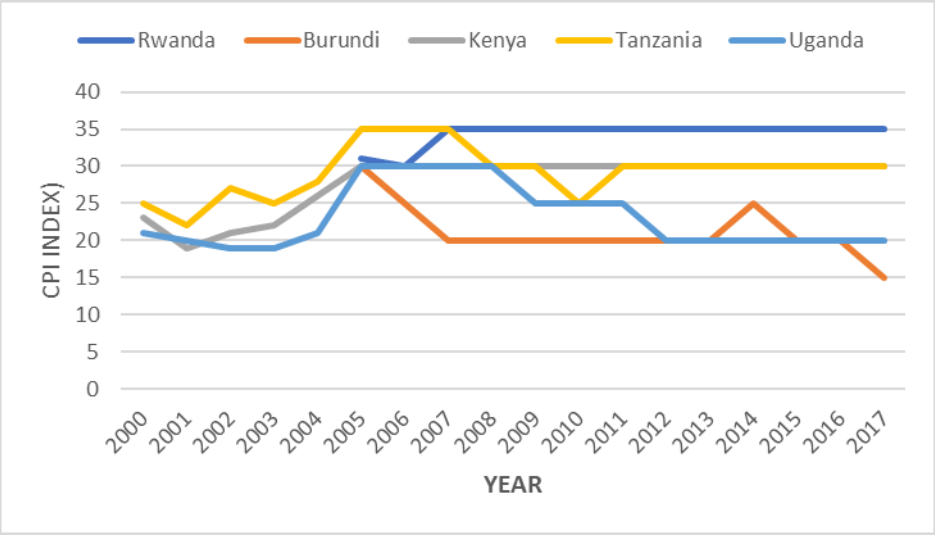

Figure 1.3: Corruption Perception Index (CPI)
Source: Author using Corruption Perception index

From figure 1.3, Tanzania was ranked as the second-least corrupt country within the East African Community after Rwanda which performed impressively at 35% and above throughout since 2007. State of corruption by Transparency International's 2013 and 2014 ranked Tanzania number 111 (30%) out of 177 and number 119 (30%) out of 175 countries and territories on the global index respectively. On the other hand, Uganda became the second most corrupt country after Burundi which was ranked as the worst operating mostly at the lows of 20%. In the years 2011, 2012 and 2013, Uganda was ranked 143 (25%) out of 183, 130 (20%) out of 176 and 140 (20%) out of 177 countries and territories respectively. The higher score indicates less corruption levels and lower scores out of a possible 100, shows a perception of widespread and endemic corruption in the country.

According to EACC (2016) corruption remains endemic in Kenya's public sector. AfriMap (2015) for example suggests that the politics of corruption prevention, suppression and punishment frequently feature in Kenyan political rhetoric, but rarely

is this rhetoric matched by action. Perennially, Kenya is ranked lowly in the CPI index among the countries perceived as most affected by public sector corruption with some of the worst grand corruption incidences which have almost brought the economy to its knees (AfriMap, 2015; Okoth, 2016). In 2013, the country was ranked 136 (30%) out of the 177 countries (Transparency International, 2014). Figure 1.1 shows the five countries' average corruption index trends and asserts the fact that corruption is prevalent in EAC with Rwanda exhibiting low corruption levels whereas Kenya being in the middle (mostly 30%) of the five states and Burundi recording high corruption levels according to the Transparency International criteria (CPI).

Continuous monitoring of the corruption trend movements over time is critical in evaluating the effectiveness of anti-corruption interventions in country level (UNECA, 2016). The three main measures of corruption as discussed above (that is; Mo Ibrahim's index of African governance, control of corruption index and corruption perception index) comprise the main indices whose data and discussions has been collected and presented in East Africa states. There is paucity of data with regard to other indices highlighted as potential measures of corruption in East Africa states. According to literature, certain measurements of corruption, for instance CPI and Worldwide Governance Indicators, are critical due to their significance in investment decisions, foreign policy analysis and country risk analysis (Khan, 2006; Knack, 2007).

Having comprehensively considered the three measures of corruption and explored their trends, they are all significant in describing the status of particular states as such, some are most popular measures of corruption. Each of the reviewed indicators has its own uniqueness, as well as limitations. For example, Ibrahim's index of African

governance has come under the spotlight since it depends exclusively on secondary data without triangulating with expert based assessments to get a better picture of what the state of governance is in a given African country (UNECA, 2016).

The perception index-based indicators have more demand from development partners, policy makers and international investors. However, the challenge to CPI is based on comparisons across time which is highly discouraged, as a result of yearly changes in the country coverage and methodology (Transparency International, 2012). Further, the index is associated with the problems of data aggregation from various sources. On the other hand, UNECA (2016) argues that world-wide governance indicators (control of corruption index) have limitations of their kind since much of the analyses are based on perceptions. This calls for caution when comparing different countries due to differences in social, political and economic environments. Literature acknowledges the challenges in the effectiveness and accuracy of CPI and the Worldwide Governance Indicators (Rohwer, 2009).

It is evident therefore that governance issues, corruption inclusive vary across regions and countries (Khan, 2006; Rohwer, 2009). For this reason it is not easy to come up with and recommend a universal indicator that addresses different country's needs. Thus, in estimating the role corruption plays in economic growth process, this study adopted all the three measures discussed in this study to bring forth their effect on expenditure and economic growth in EAC states.

1.1.2 Corruption Incidences and Reforms in EAC States

To deal with corruption, EAC states devised parallel mechanisms of dealing with and preventing corruption. One such mechanism is the formation of the East African Association of Anti-Corruption Authorities (EAAAC) at the regional level to show

recognition of the importance and obligation towards a regional approach to anti-corruption (Transparency International, 2015).

In addition, the EAC states subscribed to conventions at the international level, including the Convention on Prevention and Combating Corruption in 2002 by the African Union (AU). This introduced a comprehensive set of rules, standards and measures for all countries to apply in the fight against corruption. International financial institutions, on the other hand, declared their own anti-corruption policies, thus advocating for good governance as a condition for granting development aid. These efforts have not achieved much in combating corruption (Kanakulya, 2015). Based on this understanding, one would still have a lingering question as to whether all strategies adopted at national, regional or international levels were anchored on the understanding of the key determinants of corruption in totality.

According to a report by AfriMap (2015), a plethora of efforts have been deployed to fight corruption in most sub-Saharan countries in Africa since independence. However, it has been noted that corruption persistently remained a pervasive problem in the region. It is evident that high-profile corruption cases have come to light in all EAC countries. Despite Kenya having corruption prevention laws since independence, anti-corruption commissions and a series of legislations intended to prevent corruption, reported cases have continued to rise. Prevention, suppression and punishment of corruption frequently feature in Kenyan political rhetoric, but seldom is it matched by commensurate action. Corruption in Kenya manifests itself in various forms including petty and grand corruption, embezzlement of public funds and a system of political patronage which is well entrenched within the fabric of the Kenyan society (Jarso, 2010; Kichwen, 2017).

Grand corruption involves the high-level scandals that hit news headlines in Kenya. For example, the Goldenberg scandal was the first major corruption scandal in Kenya. According to Gichio (2014), the Goldenberg scandal in 1994, in which key government officials were implicated, allegedly cost the country over 10% of its Gross Domestic Product (GDP). Apart from the Goldenberg mega scandal, other grand corruption scandals, that have been witnessed in Kenya include: Anglo-Leasing of 2005, in which over $12 million of public funds was misappropriated by the government, the purchase of luxury cars mostly for personal use by government officials (Kichwen, 2017). Similarly, in the recent past, several other instances of malfeasance have been witnessed in Kenya. They include: the Maize scam of 2009, the Triton oil scandal of 2009, the November 2009 Free Primary Education (FPE) funds misappropriation, the Nairobi City Council Cemetery land scam, the Tokyo Embassy scandal and the Ministry of Defence public procurement deal of military hardware form Jordan (Jarso, 2010). Further, the NHIF, KQ scandals as well as NYS 1 and NYS 2 looting are indicated as some of the mega corruption cases that have cost Kenyan citizens billions of shillings (Kichwen, 2017).

Over the last decade, Uganda has been rocked by grand-corruption scandals involving the loss of staggering amounts of public funds. For example, in 2007, AfriMap (2015) indicated that substantial amounts of money were lost through the procurement of cars and other items required for the Commonwealth Heads of Government Meeting (CHOGM). Further, in 2011, over $1.7 million was lost in a botched purchase of 70,000 bicycles for members of local council committees across the country. AfriMap (2015) indicated that the scale of theft of public resources illustrated above is worrisome as these cases represent only a small proportion of the grand-corruption cases that have come to light over the past decade.

Like her counterparts, Tanzania is party to many global instruments seeking to combat corruption. However, in 2014, Transparency International's East African Bribery Index ranked Tanzania as the second-most corrupt country within the East African Community (AfriMap, 2015). It is estimated that, between 2001 and 2008, Tanzania lost USD1 billion (TZS1.6 trillion) to corrupt deals. Some of the re-known mega corruption scandals include: the Bank of Tanzania's 'Twin Towers' scandal, the Deep Green Finance Limited scandal, the Tegeta Escrow Account scandal as well as purchase of an obsolete radar system costing USD44 million (TZS70 billion) from British Aerospace Engineering (BAE Systems). Despite regime change, incidences of grand corruption continue to emerge in Tanzania. In July 2013, an escrow account for Independent Power Tanzania Limited (IPTL) showed suspicious transactions amounting to nearly USD122 million, IPTL is a state corporation.

Despite the establishment of anti-corruption agencies, Burundi, like Tanzania faces a deepening corruption crisis that threatens to jeopardise peace that is based on development and economic growth bolstered by the state and driven by foreign investment (Africa Report, 2012). According to Transparency international (2016), Burundi is deemed to be the most corrupt country in EAC. The country's image has suffered as a result of corruption. The strategies of capture and control in Burundi have led to a real crisis of corruption that in the long-term risks destabilising the country's economic performance, where unequal access to and distribution of resources were the root causes of a decade-old civil war (World Bank, 2011).

According to Desrosiers and Muringa (2012), corruption has trickled down to service delivery to the masses. Despite data availability challenges, available evidence shows that Burundians regularly encountered corrupt practices involving money, material

goods and favours in contacts with the justice sector, parliament, the executive, local authorities, police forces, border and tax services and education and health administration. Examples of eyebrows-raising corruption include questionable government contracting, procurement and acquisition, issues surrounding the granting of mining and oil concessions and the management of natural resources, public expropriation of land and dubious attribution of land for construction, problematic financing with regard to infrastructure, bribery and fraud associated with taxation and customs services, lack of transparency and due process with regard to the privatisation of public companies, as well as uncompetitive public sector hiring (Desrosiers & Muringa, 2012). Mega corruption scandals reported in Burundi include the Falcon 50 and Interpetrol scandals. There is, however, systemic failure to address these and other cases in an efficient and speedy manner, and are emblematic of some of the transparency, mismanagement and misappropriation issues in Burundi.

In Rwanda, the government has made the fight against corruption one of its top national priorities by putting in place adequate anti-corruption legal frameworks and monitoring institutions (Chêne, 2018). Rwanda has been listed among the least corrupt countries in Africa and EAC. However, new forms of corruption have continued to manifest in the Rwandan society despite government effort of zero tolerance to the practice and to keep Rwanda's image clean on the regional and global map (Ntwari, 2015). Although Rwanda is among Africa's five least corrupt nations, the report from the Ombudsman's office indicated manifestation of new forms of corruption and bribery over the last decade with new ways coming up, making it more difficult to trace and investigate the cases. This shift has been caused by the trends of technology, modernisation and it is indeed very hard to track the cases.

Corruption and bribery are perceived to be getting worse in many countries across Sub-Saharan Africa, and trust in governments is falling worldwide, where some sections of the population engage on corruption to access public institutions and services (Chêne, 2018; Ntwari, 2015). Several other reforms and laws have been enacted to combat the widespread cases of petty and grand corruption at national as well as region levels. All EAC states have extensive legal frameworks that could, if effectively implemented, significantly reduce corruption. Some of the legal regulatory frameworks include: provision for the regulation, management, expenditure and accountability of election-campaign funds during elections; enforce standards of ethics and integrity among public officers; provision for the criminalisation of money laundering and the establishment of an independent institution responsible for combating money laundering; to provide for the protection, rights and welfare of victims of offences, and lastly providing for the right to access public information (AfriMap 2015).

Several reports have also been put in place to support the fight against corruption in Kenya (The Ndungu Report: Land & Graft in Kenya & Ndegwa Commission Report). In Uganda, (Public Service Review and Re-organization Commission Report & Commission of Inquiry of Corruption in the Uganda Revenue Authority), Tanzania (Warioba-led Commission Report against Corruption & The first National Anticorruption Strategy and Action Plan Report (NACSAP I), Rwanda (National Policy to Fight against Corruption), and Burundi Anti-Corruption Board. However, these measures and reports have failed to bring major gains in terms of control of corruption in EAC, considering these countries are ranked highly in corruption by the Transparency international (CPI), World bank,control of corruption and Mo Ibrahim Governance index ratings.

1.1.3 Determinants of Corruption in EAC States

Over the past decade, many developing countries have expressed their aspirations and developed their business plans in order to reach the emerging economies stage, but the EAC region is believed to be among the most corrupt in the world based on the corruption perception indices by Transparency International (2016). Further, in the effort to curb the vice, there has been unending debate and there is no consensus on the true determinants of corruption (Elbahnasawy & Revier, 2012). Accordingly, the World Bank (2000) although corruption is an international issue affecting all countries of the world at different degrees, the factors (determinants) of corruption are not the same in all countries.

While studies have previously queried the causes of corruption both in developed and developing countries (Abed & Gupta, 2002; Andving, Odd-helge, Ata & Arvis,2011 ;Inge and Tina, 2000;), most of them have largely analysed economic determinants of corruption, and are inclined to detect the economic consequences of corruption. On the other hand, these studies have intended to reveal the economic causes of corruption. Besides the basic factors such as economic growth and inflation, there are several other economic and non-economic factors that affect corruption.

The size of the unregistered economy, government regulations, government's role in economy, public sector recruitment and wages, poverty and inequality in income distribution, trade openness, tax system, economy's competitiveness and economic freedom are extensively mentioned among others as the potential factors that determine corruption (Amanullah & Eatzaz, 2007;Ata & Arvis, 2011;Brown, *et al*. 2005; Orayo & Mose, 2016). Further, among non-economic determinants, studies suggest the corruption can be determined by the socio-political and religious determinants (Shabbir & Anwar, 2007).

EAC states envisage to follow the path leading to targeted and sustainable economic growth over time (Orayo & Mose, 2016). To achieve this, the policy makers need to understand the specific determinants of corruption in EAC Member states. This study clearly established economic, political and social determinants of corruption in EAC states.

1.1.4 Review of Economic Growth in EAC States (2000-2018)

Figure 1.5 shows the trends of economic growth in EAC states.

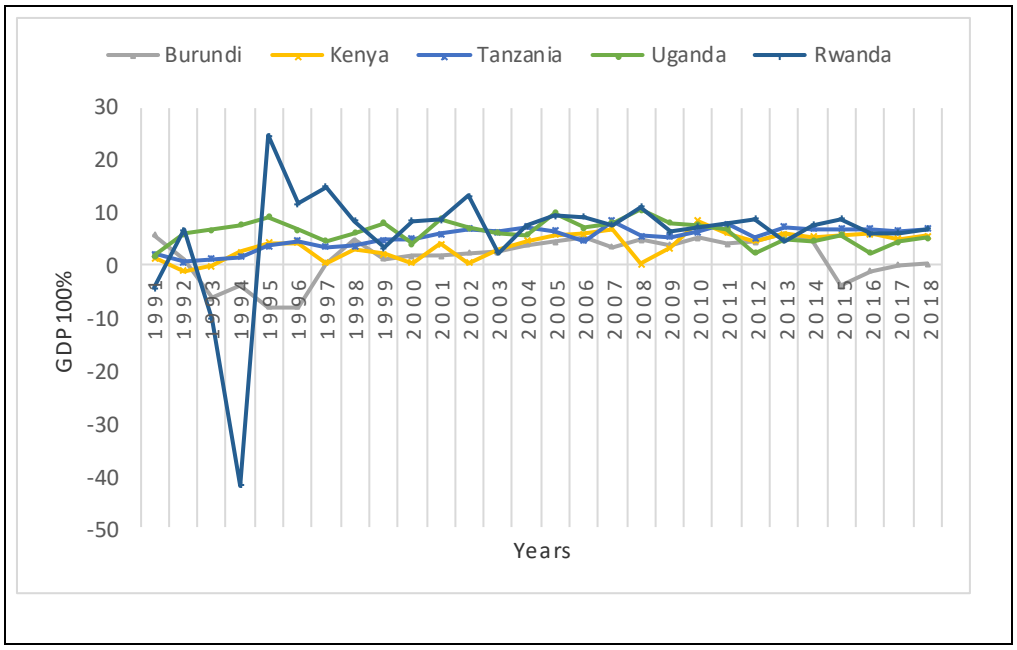

Figure 1.4: Trends of Economic Growth of EAC States
Source: World Bank Development Indicators

Figure 1.5 shows the annual economic growth of EAC states (Kenya, Uganda, Rwanda and Tanzania). In the years 1996 and 1997 Kenya experienced an annual growth of 3.2 percent and 2.3 percent respectively. The annual growth was at its lowest in the year 2000-2002 before it averagely grew at an annual rate of 5.1 percent until 2006 and 2007 when the economy grew at annual rate of 3.6 and 4 percent respectively. In the year 2007, the annual growth rate was 6.9 percent. After the post-election violence of 2007-2008, the economy shrunk and this was depicted with the

economic growth rate of 0.2 percent in the year 2008. The Kenyan economy registered improved economic performance in 2012 with an annual growth of 4.6 per cent in GDP compared to 4.4 per cent in 2011.

The Ugandan economy annual growth rate has been stable since the year 1996, considering that it was 4.9 percent and continued to grow steadily till the year 2006 when it reached the peak, recording an average growth rate of 10 percent. Even though the annual economic growth rate has been growing steadily, it has not escaped some economic shock and this is seen in the decline of annual growth rate to 3.5 percent in 2013 and 4.5 percent in the year 2014. In Tanzania, the annual growth rate for the 2014, 2015, 2016 was at its peak recording average annual growth of 6.9 percent; in 2013 it was 5.9 percent. In the year 2011, Tanzania's annual growth rate was 7.2 percent. Tanzania annual economic growth rate has been one of the most stable and highest in the years under review, as indicated in Figure 1.5. Rwanda recorded impressive economic growth in the last two decades as compared to other states in EAC. In 1996, it grew by 12.7 percent and dropped from 13.8 percent in 1997 to 8.3 percent in 2000. It was the lowest in the 2004 at 1.4 percent. In the year 2009 it was 11 percent. In the years 2013, 2014, and 2015, it was 4.6 percent, 7 percent and 6.9 percent respectively. Burundi's economic growth has been the most erratic and unpredictable in the region. The trends in economic performance of EAC states justify the premise that economic growth in the region is an idiosyncratic phenomenon that yields varied growth because of dissimilar technology and other obstacles which include corruption.

1.1.5 Review of Government Expenditure in EAC States (2000-2018)

Following the available statistics, figure 1.4 on government spending shows an increasing trend in the five EAC states.

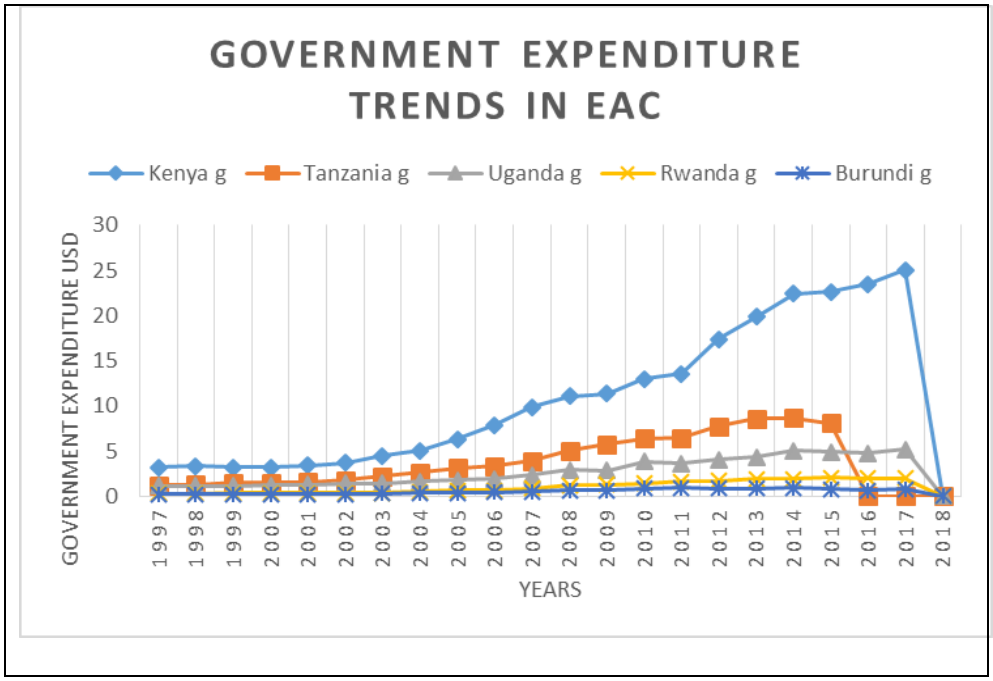

Figure 1.5: Trends of Government Expenditure in EAC States
Source: IMF Indicators

EAC states have consistently recorded increasing government spending over the years. In terms of expenditure as a share of GDP, the average share of expenditure to GDP for the five countries (Kenya, Uganda, Tanzania, Burundi and Rwanda) oscillates between 12 percent and 42 percent of GDP, but Burundi has conspicuously exercised erratic government expenditure compared to all other EAC countries right from the year 2002 to 2016, with its government expenditure as a share of GDP oscillating between 20-42 percent of the GDP (KNBS, 2005, 2010 and 2016).

Figure 1.4 shows that the government expenditure for Kenya was 3.23 billion USD (18.67 percent of GDP) in the year 2000 and rose to 25.01 billion USD (27.314 percent of GDP) in the year 2017; an increase by 674 percent. Uganda's' expenditure in the year 2000 was 1.18 billion USD (21.745 percent of GDP) but rose to 2.7 billion USD(1716 percent of GDP) in the year 2007, in the year 2015 it increased to 4.88 billion USD(19.38 percent of GDP) an increase of more than 653 percent. This further increased to 5.1 billion USD (19.58 percent of GDP) in the year 2017.

Tanzania's' expenditure in the year 2000 was about 1.52 USD (12.27 percent of GDP), but by 2008 it had increased by about 232 percent to 5.06 billion USD (18.5 percent of GDP). This expenditure further increased to 8.64 billion USD (19.38 percent of GDP) in the year 2013 before dropping slightly to 8.22 billion USD (17.81 percent of GDP) in the year 2015.

On the other hand, Rwanda's expenditure in the year 2000 was 0.37 billion USD (21.75 percent of GDP) increasing to USD1.42 billion USD (25.77 percent of GDP) in the year 2010. Its GDP amounted to 5.77 billion USD, 8.41 billion USD and 8.92 billion USD in the 2015, 2016 and 2017 respectively. This was an increase of over 440 percent from the year 2000. Burundi's government expenditure in the year 2000 was 0.2 billion USD (24.65 percent of GDP). In 2011 it was 0.94 billion USD (42.18 percent of GDP) and it was 0.7 billion USD (22.52 percent of GDP) by 2017, which was an increase of over 250 percent.

The overall observation from the government expenditure trends paints a picture of an ever increasing expenditure. The country's Public Expenditure, Procurement, and Financial Accountability (PEFA) report (2012) and IMF Monitoring and Managing Fiscal Risks in EAC (2015) argue that the expenditure for the EAC states is higher than average. This outcome suggests that in-year expenditure plans are not realistic and that budget execution is weak. This suggests a possibility that corrupt public officers may exaggerate public expenditures for personal gain (Tanzi & Davoodi, 1997; Farida, 2007).

1.2 Statement of the Problem

The pursuit of sustainable economic development amidst corruption has become a fundamental challenge for both low and high-income countries in contemporary times

(UNECA, 2016). Evidence of the effect of corruption on economic growth supports the premise that it is an international problem, which requires both national and international solutions. One school of thought argues that corruption is an obstacle to economic growth and has a long run negative effects (sands the wheels) on sustainable economic development (Healy & Ramanna 2013; Knight 2013; Mauro, 1995; Tanzi & Davoodi, 1997; UNECA, 2016; World Bank, 2000;). The other school of thought postulates that corruption can boost economic growth (greases the wheels) in the presence of weak regulatory frameworks and result to a Pareto optimal outcome via increase in public expenditure (Leff, 2002; Rashid, 1981; Bardhan, 1997).

Most of the regional blocs in Africa that are advocating for integration especially EAC are ranked among the most corrupt countries globally. The region is also characterised with ever increasing government expenditure, high fiscal deficits and retarded economic growth (Mwakikagile, 2014b; Transparency International, 2015; 2017; JICA, 2013; Kenya Vision, 2030).To this effect, the individual countries in the EAC region have failed to attain and sustain an average of 7% per capita economic growth rate to fast-track the set SDGs and African agenda 2063 (DESA, 2018).

Available studies have concentrated on examining the effect of corruption on growth with main focus on regional blocs in developed nations with little focus in EAC member states. However, very few empirical studies have explored the nexus between corruption, government expenditure and economic growth (Bryant & Javaldi 2016;Dridi, 2014; Haydaroğlu, 2016; Henri, 2018; Hope, 2014;Hüseyni & Çelik, 2017; Kéïta, 2017;Omoteso & Ishola 2015; 2016; Wu et al., 2017; Yalçınkaya,). Similarly, these studies have not shown lucidly the direct and indirect effect of corruption on growth through use of system of structural equations. Some of these

studies are either country level studies or based on one indicator for corruption. This study is imperative in the EAC region with a view of proposing appropriate policy choices. The study empirically established the determinants of corruption and its effect on public expenditure and economic growth using a corruption indicators.

1.3 Research Questions

The study was guided by the following questions:

i. What are the determinants of corruption in the East African Community states?
ii. What is the effect of corruption on government expenditure in East African Community states?
iii. What is the effect of corruption on economic growth in East African Community states?

1.4 Objectives of the Study

The main objective of this study was to investigate the determinants and effect of corruption on government expenditure and economic growth in the East African Community states. The specific objectives of study are:

i. To establish the determinants of corruption in East African Community states.
ii. To determine the effect of corruption on government expenditure in East African Community states.
iii. To analyse the effect of corruption on economic growth in East African Community states.

1.5 Significance of the Study

Most decisions made by governments of developing countries are rooted in the desire to spur economic growth and increase general public welfare, often through the mechanism of increased public expenditure which does not translate to economic growth. This study will therefore inform policy makers in the EAC member states on the main determinants of corruption and the effect of corruption on prosperity of their economies and suggest remedies. The findings may be necessary in triggering further studies by scholars on this subject to different sub sectors in the respective states. Lastly, it will contribute to a pool of knowledge on determinants of corruption, and the effect of corruption on government expenditure and economic growth in the developing economies.

1.6 Scope of the Study

The study concentrates on five EAC member states (Kenya, Tanzania, Uganda, Rwanda and Burundi). The study was limited to the period 2000 to 2017, especially because during this period the data on corruption was available. The research further focused on corruption, government expenditure and economic growth. The study employed the Mo Ibrahim accountability Index, CPI, and World governance indicators (Control of Corruption) as a measure of corruption.

1.7 Limitation of the Study

The study failed to incorporate all East Africa community states, specifically Southern Sudan due to unavailability of data corruption.

1.8 Organization of the Study

This study is organized in five chapters namely: chapter one which outlines the background, statement of the problem, research questions and objectives. Chapter two reviews the relevant literature both theoretical and empirical. Chapter three presents the research design and the methodology while chapter four presents the empirical findings of the study. Finally chapter five gives the summary, conclusions, policy implication of the study and areas for further studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter is divided into four sections: Section one introduces the chapter; Section two discusses theoretical literature relevant to the study; Section three discusses empirical literature and section four presents the overview of the literature.

2.2 Theoretical Literature

2.2.1 Becker Theory of Crime

The theory of crime by Becker (1968) is extended by the standard principle - agent works of Shleifer and Vishny (1993), where the government produces one homogenous good which has monopolistic power in its production. It is assumed that the price of the good is (P) with demand (D) from the private agents. The corruption component is incorporated in the model by assuming that the government has the monopoly power of refusing to provide the good if there is no bribe given. When the good is provided then the corruption aspect (bribery) is incorporated otherwise the provision is denied. There are two ways bribery (corruption) comes into play: A case where the chances of risk of detection is minimal and under this framework where the government official gets the price of the good plus the bribe.

$$P1 = P + B \quad \text{..... 2.1}$$

The second scenario is where the official hides the entire sale and takes the price of the good and hence the price of the good is

$$B < P \quad \text{..... 2.2}$$

Where (B) is the bribe and (P) is the actual price of the public good or the actual amount of revenue lost to public sector due to corruption. The bribe is less than the actual price. If there is no price discrimination by the government official, he equates marginal cost to marginal revenue in order to maximize his profits. In the second case, the marginal cost to the official for providing the good is simply its price **(P)** while in the first case the marginal cost is equal to zero.

Secondly, if the risk of detection is high (penalties), the model does not change much but the situation is significantly altered although the level of corruption remains the same. If the cost of detection is an increasing function of the bribe then the government official will charge a lower bribe and increase the amount that is supplied to private agents. If the demand for a good is increasing, the bribe may increase and reduce the output (behave like a monopolist). The level of corruption will be higher when the public sector has a monopolistic power providing a good or service and the corresponding accounting system is rather poor. The situation is whole perfectly consistent with the theoretical framework introduced by Krueger (1974) and Becker and Stigler (1974) and Rose-Ackerman (1995). This is in agreement with this corruption theoretical framework and concludes that reforms, which induce competitiveness help, induce corruption incentives.

2.2.2 Solow Growth Model

Solow model developed by Solow (1956) argue that output, physical capital, labour and knowledge show the degree of development of a country. These factors are used to describe the economic growth path of a country. The model considers population growth, savings rate, and technological progress as exogenous variables. As two main factors of production, capital and labour are each compensated on their marginal

price. Considering these conditions, a labour enhancing neoclassical production function in Cobb-Douglas form at time (t) can be written as follows:

$$Y_{(t)} = F(A_t K_t L_t) = AKt^{\alpha}(L_t)^{1-\alpha} = A_t \ Kt^{\alpha}(L_t)^{1-\alpha} \text{.....2.3}$$

Where, $0 < \alpha < 1$

Here, Y is the aggregate level of real income, L is the amount of labour engaged, K is the level of physical capital and A represents multifactor or total productivity. In the above function, time affects output only through L, K and A. In this model, the economy is considered to be at a steady state when all macroeconomic variables that determine growth improve at the same rate. Technological progress on the other hand influences growth of the economy exogenously. However, some of the assumptions that must hold include the following: that the economy approaches a steady state in the long run, the steady-state level of income relies on the saving rates, depreciation and population growth, and lastly, rate of growth of income per person during the steady-state depends only on the rate of technological development, but not on the rates of saving, depreciation and population growth (Solow, 1956).

In the steady state, the capital-to-income ratio is constant and thus the marginal product of capital (MPK) is constant, while the marginal product of labour (MPL) grows at the rate of technological progress. By extension of Solow model, economic growth of a country depends on several macroeconomics variables where technological progress and innovation is included. These factors can also be affected by corruption. On the same note, it is possible to demonstrate how these factors augment growth and also incorporate corruption directly and indirectly in an extended neoclassical Solow model and demonstrate how growth is determined by

technological progress in the presence of not only physical capital accumulation, labour and human capital accumulation, but also public sector.

2.2.3 Wagner's Theory of Public Expenditure

Wagner theory of public expenditure developed by Wagner and Peacock (1958) reflects the policy choices and bureaucracy of governments. It is governments' duty to decide upon the quantity and quality of goods and services to provide or produce. Public expenditures represent the costs of carrying out these bureaucracy and policies. Historically, public expenditure has been on upward trend over time, and in almost every country. While a private economic unit was guided by profit gains, the public sector was motivated by social welfare of its citizenry. According to Wagner and Peacock (1958), there is an inherent tendency for the increase in activities of different layers of a government (national and county governments in Kenya) and the prevailing public expenditure reflects the requirement of a given public historical situation. Any alteration in the public expenditure reflects the underlying changes in the economic structure and development.

Wagner and peacock (1958) justified public expenditure in terms of objective and subjective criteria, such as citizenry needs and subjective changes which may include technological and institutional changes. As time passes, various levels of government undertake new functions and these new functions need more resources, meaning that the range of activities carried out within the public sector is extended. Bird (1971) has pointed out that Wagner law works under rising per capita income, technological and institutional changes of a particular sort and at least implicitly, democratization in the sense of wider political participation of the polity. A rise in public expenditure, may be motivated by market failure and/or the monopolistic trends, which require state

intervention in the form of nationalization or monopoly control. This particularly, may incorporate the market failure due to reallocation of resources due to existence of institutional failures occasioned by corruption or monopolistic tendencies, which include rent seeking of public officials. This increases the public expenditure as it suggests the extension of government activities not for public good but for individual gain.

2.2.4 The Extractive-Distributive Corruption (Rent-Seeking) Theory and Choices of Public Expenditure

The nexus between corruption and public sector which includes resource allocation is explained through two theories: the rent-seeking theory (Krueger, 1974) and the grabbing hand theory (Shleifer and Vishny, 1994; 1998). These two theories posit that politicians and bureaucrats receive individual benefit based on their positions and power in public service. Rent-seeking theory explains that these bureaucrats and politicians tend to use their positions and power to enrich themselves corruptly through bribery. The grabbing hand theory asserts that these individuals steal or exploit state assets for their private benefit.

The extractive corruption theory as stated in the initial work of Tullok (1967) and coined by Krueger (1974) works for those in authoritative positions in the government, who use state apparatus as a way of extracting wealth of the nation. According to this theory, rent seeking involves corruptly growing individual share without increasing the public share. The extractive corruption is enriched by corrupt bureaucrats who give or take inducements for applying discretionary authority and power for awarding legal or illegal paybacks to the citizenry.

This scenario is common in many Sub-Saharan Africa countries where corruption by those in the state is depicted in several ways such as appointing their political rivals to reduce opposition when extracting public resources or rent-seeking. This practice in developing countries is exacerbated by their weak administrative governance structures. This leads to misallocation and inefficient distribution of public resources in terms of investment of public spending and the region is fraught with red tape and rent seeking government officials who use their positions for their own gain (Arifin, et al., 2015).

The proponents of distributive corruption theory including Shleisfer and Vishy (1991) and Murphy (1991, 1993) argue that the state is so weak that it succumbs to the whims of social categorization based on ethnicity or region of influence of operations of state through bribery or other corrupt means. Resources are dispersed to some individuals to buy loyalty. On the other hand, partners are at times exempted from tax payment and may be given special use of public goods at low price and thus earn extra paybacks than they are meant to attract. Distributive corruption affects efficiency and productivity of public expenditure or public investment which influences economic growth in the long run (Mauro, 1998; Gupta et al., 2000).

According to Transparency International (2017), EAC states are highly ranked in terms of corruption levels which lead to high public expenditure that unfortunately does not translate to expected economic growth. Based on the rent seeking theory, there is a possibility that corruption distorts the allocation of public spending; in particular, public allocation of spending is highly dependent on the nature of the state and government bureaucrats (Varoudakis, 1996).

2.2.5 Keynesian Theory of Growth

Keynesian theory by Keynes (1930) posits that economic growth occurs as a result of increasing government expenditure. In this regard, government expenditure is an exogenous variable and is used as an efficient policy variable that influences economic growth. Keynes argues that inadequate effective demand could lead to high unemployment periods. An economy's output or income is composed of the sum of four components: consumption, investment, government purchases, and net exports. Any increase in effective demand is based on the four components. Changes in aggregate effective demand, whether anticipated or unanticipated, lead to short-run effect on the economy's income or output and employment.

Keynesians argue that, prices are somewhat rigid and any fluctuations in any of the four components of spending—consumption, investment, or government expenditures will cause income or output to change. If government spending increases by a unit, all other spending components remaining constant, then income or output will change. According to the Keynesian theory, this change is known as multiplier effect; which is an output change caused by changes in public spending on each of the four components. If the fiscal multiplier is greater than one, then a unit increase in government spending would result in an increase in output greater than one unit. During recession, effective demand goes down as spending goes down. This reduction in spending by consumers may result in less spending on investment by firms translating to decrease in government production. At such a point, the Keynesian economics proposes state intervention to augment demand.

In support of the Keynesian argument, Kneller, Bleaney and Kneller (1999) carried out a research on growth of public expenditure and concluded that the rate of growth

of public expenditure is high at the early stages of economic development because government strives to provide the basic infrastructural facilities (social overheads) justifying increase in government spending. According to Keynes, this increase in government expenditure should translate to high economic growth and push the countries towards their national economic growth targets; however, this is not the case in EAC states.

2.3 Empirical Literature Review

There is considerable debate over the effects of both corruption and government spending on growth. This section explores various past studies on determinants of corruption, corruption and economic growth, as well as corruption and government expenditure.

2.3.1 Determinants of Corruption

Collier (2000), and Collier and Gunning (1999), on the twin studies on how to reduce corruption and explaining African economic performance in Sub-Saharan countries respectively, posit that corruption increased in Africa due to the existence of opportunities for corruption. The patronage political systems and weak anti-corruption institutions promote corruption in those economies. Corruption contributes to poor public social capital especially in sub-Sahara countries. The effect is more evident in developing countries where consumption and spending is curtailed because of the kickbacks and bribery. These corruption activities affect household consumption expenditure and the general living standards of living. Where corruption thrives, expenditure is diverted and allocation is done in favour of private individuals who siphon the funds out of the country. Usually this is possible if there are weak state anticorruption agencies to discourage the vice. Though the study was in Africa, there

is unique experience in EAC region in the quest to achieve the desired economic growth.

Mbaku (2003) in the study on corruption in African countries, argues that there is a failure of anti-corruption programs in Africa through societal, legal, market and political reforms, which is as a result of incompetent and inefficient bureaucrats, coupled with the widespread inequality. The perpetual debate of issues of corruption for African countries tend to dominate in political arena, in business and in daily lives of general public, but little action to stop it is evident. The study failed to bring to the core the main socioeconomic and political variables that explain corruption.

Lambsdorff (2005; 2003) carried out two studies: Consequences and causes of corruption – What do we know from a cross-section of countries? And the other study focuses on how corruption affects productivity. The studies reviewed literature on the effects, consequences and causes of corruption. These included research on the impact of corruption on investment, GDP, institutional quality, government expenditure, and poverty, international flows of capital, goods and aid, causes of corruption focused on absence of competition, policy distortions, political systems, public salaries as well as an examination of colonialism, gender and other cultural dimensions. The two studies confirmed the premise that corruption continues to threaten development.

Corruption is twofold: public sector corruption as well as private sector corruption. The public sector corruption implies, misuse of public office for private benefits. Chaudhry and Ghulam (2007) focused more on the public sector exploring the determinants of corruption in developing countries. The study analysed 41 developing countries to investigate the determinants of corruption. Corruption determinants were sub-divided into economic determinants and non-economic determinants. The

economic determinants included economic freedom, globalization, level of education, distribution of income and average level of income. The non-economic determinants list consisted of press freedom, democracy and share of population affiliated with particular religion. The empirical findings of the study indicate that all economic determinants are negatively related to the perceived level of corruption except distribution of income. Non-economic determinants did not significantly explain the variations in the level of corruption. This study concluded that government should focus on the economic factors to curb the level of corruption. The study also established that non-economic determinants, which included the social- political factors: political rights, uninterrupted democracy, electoral systems, and even political instability, were insignificant. Regional blocs in African countries report that they determine the corruption levels and the argument was supported by the findings obtained by Nurudeen et al. (2014) on corruption and political instability.

Del Monte and Papagni (2007) investigated the determinants of corruption in Italy in the period 1963-2000 by the use of statistics on crimes (corruption) against the public administration at regional level. The study used dynamic econometric model ARDL for panel data analysis of corruption in Italian regions. Using a systematic a review of the existing literature on the economic, political and cultural likely causes of corruption, the paper examined the II post-war years and developed some hypotheses on institutional changes, social network and political competition as some determinants of corruption. Econometric estimates of a model established that public expenditure and GDP was significantly low in explaining corruption, while political and cultural, presence of voluntary organizations; absenteeism at national elections were the most important factors explaining corruption in Italy.

Timofeyev (2014) used linear models and intra class correlations to analyse predictors of organizational losses due to occupational corruption in the United States of America. It was established that corruption does not depend on employment. Corruption was found to be determined by the kind of industry and organization type, although minor issues and disparities in predictors exist both inside and outside the United States.

Touati (2014) conducted a study to explore the determinants of economic corruption in the Arab countries. The study focused on the dangers and remedies. Panel data model was used where the corruption perception index was considered a dependent variable, and Human Development Index (HDI) and Inflation Rate (INF), over the period 2005 to 2010. Samples of 21 Arab countries were involved. The study showed that there is no statistically significant relationship between the corruption measured by the CPI as a dependent variable, and the HDI, press freedom index and inflation rate as independent variables. The study basically considered countries from the Middle East that are different from African countries.

Odhiambo (2015) examined the determinants of corruption in Kenya. Secondary dataset obtained from afro-Barometer Round 5 was used. The following variables were used: race, gender, ethnicity, employment status, education and religion. In estimation, the study used binary probity regression model. From the study results: race, gender, ethnicity, employment status, education and religiosity, were found to be statistically significant determinants whereas age, location and religion were not significant determinants of corruption in Kenya. The Study dwelled on socio-demographic determinants of corruption in Kenya and was therefore, limited in scope.

A quantitative study by Ghaniy and Hastiadi (2016) employed a cross-sectional data in analysing corruption. The study analysed various political, social and economic determinants as measured through development indicators and various indices upon the perceived level of corruption indicated by corruption perception index in 92 observed countries for the year 2014. Corruption perception index was employed as a dependent variable which was obtained from Transparency International. Comparative analyses of 46 developing and 46 developed countries were considered. In estimation, ordinary least squares (OLS) method and tests on cross-section data was used. Considering all countries regardless of whether they were developed or developing, the findings showed that the level of development, degree of democracy, economic freedom, level of education, political stability and religion (protestant) have significant impact on the perceived level of corruption. It could be observed that variables that were statistically significant followed the direction of the hypotheses except for education and political stability where the former had a negative effect whereas the latter had a positive effect on corruption. Considering developed countries only, economic freedom, degree of democracy, Islam and Protestantism were found to be significant whereas on the developing countries, the significant variables were the degree of democracy, and the level of development. These findings provide a greenlight to this study by considering key factors; however, the study being cross-sectional will not be in a position to project the long-term effect of corruption. Secondly, the study relied on the perception index as a measure of corruption which does not address corruption as an international problem, because they are based on personal opinions.

Gomes, Vendrell-Herrero, Mellahi, Angwin and Sousa (2017) conducted a study to test the self-selection theory in high corruption environments based on evidence from exporting African small and medium enterprises (SMEs). Logistic regressions were conducted on a cross section of 233 SMEs located in nine African countries. The study used the World Bank enterprise survey, a database which is enriched with data on perceived corruption levels at firm level. The study revealed that self-selection theory is only associated with low corruption environments, whereas in high corruption environments, outward looking strategies and cluster networks were fundamentally major factors that affected export trade by African countries' SMEs. This study was related to a study by Hope (2014) on Kenya's corruption problem: causes and consequences. The study established key causes of corruption, which are: absence of effective institutions, centralized democracies, impunity and lack of public accountability. These studies, however, failed to consider the macro-environment which has been shown in other literature as having an influence on corruption. In addition, perceived corruption levels at firm level may not be a better measure of corruption as perception may not reflect the true picture and status of corruption.

Cultural, political and economic structures of society are affected by corruption. A study by Ghaniy and Hastiadi (2017) examined political, social and economic determinants of corruption measured through development indicators and various indices, upon the perceived level of corruption indicated by corruption perception index in 92 observed countries for the year of 2014. Through OLS method and tests on cross-section data, the findings revealed that level of development, degree of democracy, economic freedom, level of education, political stability and religion have significant impact on the perceived level of corruption. They, however, concluded that

there are differences in significant variables between the developing and developed countries groups.

Hunady (2017) examined individual and institutional determinants of corruption in the EU countries. The study analyzed the determinants of the incidence of corruption as well as the tolerance of corruption. The study used legit regressions that utilized data derived from Euro barometer. The results strongly suggest that gender, age and education are important factors. The rule of law, government effectiveness and public accountability seem to be other factors that negatively correlate with the level of corruption within a country. The study considered developed countries with stronger institutions and laws.

Abdelbaki (2017) carried out an investigation of economic determinants of corruption in Egypt under Mubarak Regime. The study used Autoregressive Distributed Lag (ARDL) approach which yields precise and consistent estimates of long run parameter even in the presence of endogenous variables. The main findings indicated that globalization and the government intervention in the economy had positive influence on corruption level. Education level and FDI had inverse effects on corruption level in the short run. Whereas, in the long run, only education level and government intervention had a significant effects on the level of corruption. The study considered only one regime.

Gani (2017) investigated the main factors determining corruption in developing countries. The study employed the fixed-effects estimation technique to data for several developing countries, pooled for the period 2004 to 2010. The empirical results revealed that the level of economic development, country size, natural resource exports, foreign direct investment, absence of democracy, and colonial legacy as the

main correlates of corruption in the developing economies. The period considered was however short.

Corruption is a phenomenon which affects every society in both, geographical and historical context. A study was done by Picón and Boehm (2019) utilizing a cross-country quintile regression model to establish whether the determinants of corruption differ between countries with different levels of corruption. They used the broadest and most recent dataset applied until now in such type of research (170 countries with data from 2018). The findings revealed that the variables including size of government and share of protestant population are good predictors of the level of corruption only for specific levels of corruption, while other variables such as level of democracy, economic freedom, and income levels are strongly significant for all levels of corruption. The study failed to differentiate developed and developing countries.

Tyburski, Egan and Schneider (2020) did a subnational analysis of resource curse dynamics in American states to explore determinants of corruption. They drew on comparative resource curse literature and American literature on the determinants of corruption. The study also relied on hierarchical linear models to interpret federal corruption convictions data for the fifty American states between 1976 and 2012. They also applied Generalized Method of Moments (GMM) estimators to account for potential endogeneity. The study revealed that the impact of natural resource extraction on corruption outcomes is state-dependent. Specifically, the study established that in environments where corruption is already high, natural resource windfalls allow political actors and economic elites to take advantage of state

brokerage, further increasing corruption. However, in previously less-corrupt states, increased natural resource extraction does not induce corruption.

Mangafić and Veselinović (2020) investigated the determinants of corruption at the individual level in Bosnia-Herzegovina. They presented evidence on the spread of corruption in five sectors of the economy in Bosnia-Herzegovina and analyzed the effects of determinants at the individual level on the likelihood of engaging in bribery. Their findings confirmed that specific personal characteristics predicted corrupt behaviour, however findings varied across sectors. In addition, logistic regression was used to generate models to establish predictions on the likelihood of an individual engaging in corruption. The results show that corruption is a widespread phenomenon in Bosnia-Herzegovina, and highly educated people, people living in urban areas, and individuals with higher incomes had high probability of engaging in bribery in several sectors. The study, however, employed perception-based data and used bribery as an indicator for corruption.

2.3.2 Corruption and Government Expenditure

Mlambo (2005) while assessing the determinants of FDI inflow in Southern African Development Countries (SADC) region, identified corruption to be the key variable. The study argued that foreign investors were averse to corruption in some host countries and found that the cost of business transactions led to inefficient economic outcomes and therefore affected economic growth negatively. The study concluded that efforts at regional level to promote FDI must be cognisant of the significance of corruption. In Africa, corruption was recorded as a major obstacle to FDI inflows. In a related study Hossain (2015) sought to find out if corruption is a major hindrance to FDI. The study used panel data from 1998 to 2014 among 48 different countries to

determine the relationship between FDI and corruption. The results of the three panel estimation methods revealed that the variable of corruption had a negative relationship with FDI and was statistically significant in determining corruption.

Delavallade (2006) examined the impact of corruption on government spending structure according to specific sectors. The dependent variables were the specific sectors of government spending as a ratio of total government spending. Independent variables were corruption indicators of World Bank and other controlled variables (e.g., level of urbanization, GDP per person, population percentage between 0 to 14 years of age). By using three-phase method of least squares the study found that within 64 countries in the years 1996 and 2001 corruption deforms the government spending structure in a way that it limits the volume of government spending aimed at social area (social protection, health and education). This type of spending gives more freedom of action, hence more opportunities for corruption, than social spending which involves more predetermined spending. The study however used disaggregated measure of expenditure (the individual sectors of government spending as a percent ratio on total government spending) as a dependent variable which certainly left out other portion of government expenditure.

A study by Shonchoy (2010) focussed on exploring the determinants of government expenditure using panel data for 111 countries found that corruption has a negative influence on public expenditure in developing countries. The study revealed that those countries which cared less about corruption experienced low economic growth and investment levels. Another study by D'Agostino, Dunne and Pieroni (2012) examined the relationship between government spending, corruption and economic growth of a sample of African countries. The study employed the dynamic GMM in estimation.

From the findings, the detrimental effect of corruption on productivity of various expenditure components and negative effect on economic growth was confirmed.

Hashem (2014) explored the effects of corruption on government expenditures in Arab countries. The study included 13 Arab countries using data from 1998 to 2008 for 4 countries (Egypt, Jordan, Tunisia & Morocco) and data from 2003 to 2008 for other 9 countries (Bahrain, Kuwait, Oman, United Arab Emirates, Libya, Lebanon, Yemen, Qatar & Syrian Arab Republic). The study divided government expenditures into; expenditures on defence, education and health. The data on corruption was drawn from the corruption perception index (CPI) by Transparency International. The study employed a method of pooled least squares. From the findings, when CPI increases or the level of corruption decreases, there is a significant increase in government spending on education and health. In related studies, corruption affects efficiency and productivity of public expenditure or public investment which influences economic growth in the long run (Mauro, 1998; Gupta et al., 2000). Since the study faced scarcity of data, and utilized different time periods, the study was not best placed to do a comparison and failed to test for structural breaks. The study only considered perception measures of corruption from Transparency International, to get better estimates, this study used Mo Ibrahim measure of corruption.

R´eda and Cam´elia (2016) also analysed the impact of corruption and institutional quality on economic growth using a sample of 128 developed and developing countries for the period 1984-2012. They employed a panel smooth transition regression model. The study found a non-linear relationship between corruption and growth modulated by the institutional development. The study also found that

corruption can positively or negatively affect growth in case of a low or high level of institutional development.

Spyridon (2016) investigated the possible non-linear effect of corruption on human capital accumulation through two channels. The study investigated the effect of corruption on the public expenditure on education and also the effect of corruption on the physical capital investment. An endogenous two sector growth model with human capital accumulation and analysed the impact of corruption on the government expenditure. The study employed a semi-parametric method and found out that there was a nonlinear relationship between human capital and corruption.

Wu, Li, Nie and Chen (2017) established a dynamic spatial autoregressive model and a panel threshold model to test the relationships between Government expenditure, corruption and total factor productivity. They used provincial panel data from 2007 to 2014. The results illustrate that "U" shape curve relationships exist between government expenditures of administrative service, investment development, safeguard governance and total factor productivity, and that the relationship between the government expenditure structure and total factor productivity follows an "inverted U" shape curve. In addition, the findings suggest that increased corruption levels can directly reduce regional total factor productivity and that the effects of the proportions of administrative service expenditures, investment development expenditures, and safeguard governance expenditures on total factor productivity have a single corruption threshold.

The perceived level of corruption provides a possible measure of governance performance. A study by Santoro and Capasso (2016) explored the interaction between the level and composition of government expenditure and governance

performance in Europe and in MENA countries. The study involved a descriptive and a simple econometric analysis. The results pointed out that total government expenditure was positively correlated to poorer governance performance, and hence to more corruption, only when the volumes of public expenditure is already high. The study only focused on perceived level of corruption.

Cooray, Dzhumashev and Schneider (2017) investigated the relationship between corruption, the shadow economy, and public debt. It additionally examined whether the shadow economy increases the adverse effects of corruption on public debt. The model is empirically tested for 126 countries over 1996–2012. Using Ordinary Least Squares (OLS), fixed effects, system generalized method of moments (GMM) and instrumental variable estimation, and two measures of corruption that is the Corruption Perceptions Index and the Kaufmann et al. Corruption Index. From the findings, increased corruption and a larger shadow economy led to an increase in public debt. Moreover, it was found that the shadow economy magnifies the effect of corruption on public debt suggesting that they act as complements. The findings also suggested that higher government expenditure enhances the effects of corruption on government debt. The study used public debt as a proxy of expenditure.

Ngutsav (2018) investigated the effect of corruption and government expenditure on economic growth as well as the pass-through effect of corruption to economic growth through government expenditure in Nigeria between 1981 and 2015. The study made use of the Vector Error Correction Model and Impulse Response Function. Six variables of real gross domestic product (RGDP); corruption perception index (CPI); government expenditure; index of openness (IOP); inflation rate and gross fixed capital formation were used for the study. The study found that while corruption had a

negative effect on economic growth, government expenditure affected economic growth positively. These findings were supported by results of a study by Nurudeen et al. (2014), who revealed the negative effect of corruption on public spending. The study further revealed that corruption erodes gains to the economy due to increase in government expenditure.

Apergis and Apergis (2019) explored the link between corruption and government debt through a regime-based approach. The study made use of a panel of 120 countries, spanning the period 1999–2015. Panel Smooth Transition Regression (PSTR) methodological approach, as well as two alternative measures of corruption were used. The findings revealed that the relationship between corruption and debt is non-linear, while a strong threshold effect was present as well. Public debt appeared to respond faster to a high corruption regime compared to a low corruption regime, while an increase in the size of the shadow economy, government expenses, the inflation rate, interest payments on debt and military expenditure all increased the debt to GDP ratio. The study however never separated the developed economies from emerging economies.

2.3.3 Corruption and Economic Growth

Wei (2000) did a study on how taxing Corruption is on international investors, posits that a country can raise its share of investment to GDP and FDI if it manages to decrease its corruption rate and reduces the economic growth. The study also found that the effect of corruption on foreign direct investments (FDI) was negative and therefore a disincentive to FDI inflow.

Mo (2001) The study on corruption and economic growth on 54 countries using CPI , aimed at estimating a direct and indirect effect of corruption on economic growth

using a long term growth rates of per capital GDP from 1970 to 1985. The study identified three transmission channels namely, investment, human capital and political stability. The result indicates that one unit increase in the corruption index reduces the growth rate by about 0.545 percentage point. However, the direct effect of corruption becomes insignificant in both ordinary least squares (OLS) and two-stage least squares (2SLS) estimation after controlling other variables.

According to Mauro (2002) there is a close relationship between corruption and slow economic growth. Corruption affects negatively investment through the Payment of bribes to acquire investment licence which reduces the incentive to invest. Diverting public resources by politicians changes the private consumption cycle and these impacts the growth rates negatively (Bardhan, 1997:1327-1328; Mauro, 1995: 695).

A study by Kimuyu (2007) observed that some important sectors of Kenyan economy were more attracted to corruption as opposed to others. For example the manufacturing firms receiving government contracts end up paying an average of 14.2 percent of the aggregate contract as bribes to the public officials. Besides, the study noted that average firms pay 7.5 percent of their aggregate annual sales corruptly. Based on that prevalent tendency, the level of corruption in the country is affecting the international community which include, the World Bank whose international aid is channelled to specific anticorruption reform. The study was country based and was not intended to show the effect of corruption on expenditure or growth, but how corruption affect international to Kenya.

Another research conducted by Mobolaji and Omoteso (2009) investigated the impact of corruption and other institutional factors on economic growth in some selected transitional economies for the period of 1990 - 2004, based on corruption indices and

institutional variables drawn from International Country Risk Guide (ICRG – PRS) analyzed through the panel data framework. The study's results supported Mauro's hypothesis that corruption has negative impact on growth in the transitional economies. The study's results supported Mauro's hypothesis that corruption has negative impact on growth in the transitional economies.

Nadia, Galli and Ilaria (2012) studied corruption and economic growth in Italian regions using 1980 - 2004 data by use of dynamic growth model, while taking care of potential bias and endogeneity. They established the existence of negative significant relationship, between economic growth and corruption. The study also confirmed that in those regions affected by high levels of corruption, production was low. The study's findings supported Mauro's (1995) hypothesis that corruption has negative impact on growth in the transitional economies. Both studies were conducted about a decade ago while a lot of dynamic changes and efforts have been undertaken to curb corruption in developed and developing countries. Also the studies were focused on developed economies.

Egunjobi (2013) empirically investigated effect of corruption on economic growth in Nigeria using 1980 - 2009 annual time series data, study indicated that corruption per worker has a direct negative effect on output per worker and also has an indirect effect on foreign private investment, education public expenditure and capital expenditure per worker. The study also found that corruption inhibits economic growth in Nigeria. This was a country level study and used only CPI as a measure of corruption.

Muhammad, Sallahuddin and Khairuzzaman (2013) examined the impact of corruption, foreign direct investment (FDI) and workers remittances on economic

growth in a set of five South and South East Asian countries during the period ranging from 1985 to 2011 by using panel data, fixed effects and random effects models. Empirical results also show negative and statistically significant impact of endemic corruption on economic growth during the study period. The study region was outside Africa with different experience.

Mohamed (2013) carried out a study on corruption and economic growth of both 82 developed and developing countries for the period 1980-2002. The study employed a system of simultaneous equations to establish the channel through which corruption affected economic growth. The results suggested that human capital and political instability were the most important transmission channels which affected growth. The study found that corruption lowered government expenditures and had a negative impact on economic growth. These empirical results confirmed the detrimental effect of corruption on economic growth. The study further showed that corruption affected economic growth via other variables of channels.

Kamiru, Sissoko and McGowan (2013) utilized a panel data from 1997-2007 in a study which examined the effect of corruption on some developing economies; Kenya, Uganda, Tanzania, Indonesia and Chile, examined the effect of corruption on some developing economies; found that corruption had a negative effect on economic growth and development. The study also noted that some of the national and international policies that were applied to tame corruption had failed to yield fruits. The multifaceted problem needed more effort from international players. The study used fixed effect model to analyse the effect of corruption on GDP, hence did not address issue of endogeneity and it employed only one measure of corruption CPI with its shortcomings.

Pepukayi et al (2015) examined aid transnational analysis of the impact of corruption on development in Africa. This study sought to understand the link between corruption and development within Southern Africa. The study utilized a cross-national analysis of relevant data constructed to demonstrate the relationship between corruption and regional development. The study highlighted the cost of corruption for the region particularly from an economic developmental stand-point. Insights from the study contribute to scholarly debate relating to the ills of corruption and resulted in the development of a framework that might help to reduce the levels of corruption, enhance good governance, and advance sustainable development in the region. The study utilized CPI as the only measure of corruption within the Southern African Development Community (SADC) region and did not bring out the direct and indirect effect of corruption.

Omoteso and Hakeem (2015) carried out a study on the prioritization of reform policies on corruption, governance and economic growth in Sub-Saharan Africa. The study investigated the reform policies which included governance indices (especially control of corruption) on economic growth in some selected Sub-Saharan African (SSA) countries for the period 2002 to 2009. The study found that political stability and regulatory quality indices have growth enhancing features, as they impact on economic growth in the region significantly, while government effectiveness impacts negatively on the economic growth in the region. These are however not clear measures or indicators of corruption.

Ceyhun (2016) in a study that aimed to investigate the causal relationship among corruption, economic freedom and economic growth in some selected Sub-Saharan African (SSA) countries with a view to making policy implications using the Granger

causality test within a multivariate co-integration and error-correction framework for the 1996-2014 period. The study found that there was Granger causality from economic freedom to economic growth in the short term and positive unidirectional Granger causality from economic freedom and economic growth to corruption in the long term in SSA countries. The study did not include the understanding of determinants of crime and did not show the direct and indirect effect of corruption.

d'Agostino, Dunne and Pieroni (2016) examine the interrelationships between government spending, corruption and economic growth. This study provides a contribution to the debate, starting with an endogenous growth model and extending it to account for the effects of corruption on components of government spending, namely military and investment spending. The resulting model was then estimated on a comprehensive panel of 106 countries and the results show that the interactions between corruption and investment and corruption and military spending have strong negative impacts on economic growth. The findings also indicate important complementarities between corruption and military spending, that is also likely to have positive indirect effects, through reducing the size of the negative impact of the military burden. They failed to establish the robustness across different corruption measures or even levels of economic development.

Wang, Zhang and Wang (2018) using evidence from BRICS economies, the moderating role of corruption between economic growth and Co2 emissions. The study sought to apply a partial least square regression model for a panel of BRICS countries from 1996 to 2015. From our empirical findings, the moderating role of corruption is crucial in the relationship between economic growth and carbon dioxide emissions and control of corruption to reduce Co2 emissions. In addition, a significant

moderating effect of corruption is observed on the relationship between urbanization and carbon dioxide emissions in the case of BRICS countries, which signifies poor environmental performance therein. The study, however, did not establish the mediating factor for control of corruption.

Shittu, Hassan and Nawaz (2018) examined the relationship between external debt, corruption and economic growth in selected five SSA countries from 1990 to 2015. Panel unit root and panel co-integration tests were employed to test for stationarity of the series and the long-run relationship, respectively. Fully modified OLS and dynamic OLS techniques are also employed to examine the long-run coefficients of the variables of the model, as well as panel Granger causality test, in order to examine the direction of causality among the variables. The results indicated a positive relationship between corruption and economic growth, as well as a uni-directional causality running from economic growth through corruption. The models employed have limitations especially on the nature of relationship sought. The current study employed SGMM approach.

Gründler and Potrafke (2019) explored the link between corruption and economic growth. The study employed new data for 175 countries over the period 0f 2012–2018 and re-examined the nexus between corruption and economic growth. The cumulative long-run effect of corruption on growth is that real per capita GDP decreased by around 17% when the reversed Corruption Perception Index (CPI) increased by one standard deviation. The effect of corruption on economic growth is especially pronounced in autocracies and transmits to growth by decreasing FDI and increasing inflation. The study did not consider other corruption measures which are more objective.

Erum and Hussain (2019) analyzed the impact of corruption and natural resources on economic growth by incorporating the role of per capita income and Information Communication Technologies (ICT). They used panel time series data from 1984 to 2016 for 43 member countries of Organization of Islamic Corporation (OIC). They applied Cross Sectional Autoregressive Distributed Lags (CS-ARDL) approach in estimation. The results indicated that corruption impedes economic growth. Moreover, the combined effect of corruption and natural resources was positive. The study however failed to split the sample size according to low and high ICT diffusion economies.

2.4 Overview of Literature

The study reviewed number of theoretical literature such as: Becker theory of Crime (1968), Solow growth model (1956), Wagner theory of public expenditure (1958) rent seeking theory (1974), Grabbing hand theory (1994) and Keynesian theory (1930). This study employed extended of Becker theory of crime to establish determinants of corruption. The study employed an extended Wagner theory public expenditure and Solow theory to determine the effect of corruption on government expenditure and economic growth respectively.

Corruption has a number of effects on domestic investment, economic growth, and on the size and composition of government expenditure. There is rich literature on effects of corruption on macroeconomics variables, but the same literature is lacking in Sub-Saharan Africa and those available are scanty. Corruption being a multifaceted issue needs to be understood clearly and more so for those countries where the debate on effect of corruption on economic growth is ever present.

Studies examining determinants of corruption revealed several key factors. For example in Arab countries, Touati (2014) established human development index, press freedom index and inflation rate while Odhiambo (2015) found that race, gender, ethnicity, employment status, education and religion had significant effect on corruption. In addition, Ghaniy and Hastiadi (2016) established that level of development, degree of democracy, economic freedom, level of education; political stability and religion (protestant) have significant impact on the perceived level of corruption. Further, Mangafić and Veselinović (2020) indicated that more educated people, people living in urban areas, and individuals with higher incomes are more likely to engage in corrupt activities.

Studies including Mauro (1998), Wei (2000), Mo (2001), Shonchoy (2010), Nurudeen et al. (2014) and Ngutsav (2018) established the negative effect of corruption on public expenditure. Most of these studies, however, were conducted out of East Africa and they supported the premise that corruption soils the wheels of growth; hence the other hypothesis that it greases the wheels of growth is not supported.

Other studies on corruption and economic growth are also enriched but not in Africa, they include*;* Egunjobi, (2013), Mauro (1995), Mo (2001), Muhammad and Khairuzzaman (2013),Nadia, Galli, and Ilaria (2012)Pellegrini and Gerlagh (2004),concluded that corruption hinders economic growth. Muhammad, et al., (2013) revealed a negative and statistically significant impact of endemic corruption on economic growth during the study period. d'Agostino, Dunne and Pieroni (2016) revealed important complementarities between corruption and military spending. In addition, Gründler and Potrafke (2019) concluded that corruption and real per capita GDP had an inverse relationship.

On methodology, most of these studies employ panel data analysis and support the premise that corruption affects economic growth negatively in Sub-Saharan region and other trading blocs such as ECOWAS and SADC. The study by d'Agostino, Dune and Pieroni (2012) on government spending, corruption and economic growth failed to include main control variables such trade openness. The study by Kamiru, et al., (2013) used fixed effect model to analyse the effect of corruption on GDP, hence did not address issue of endogeneity and it employed only one measure of corruption CPI with its shortcomings.

This study employed three corruption indices model that is: CPI, control of corruption and Mo Ibrahim index. A comparative analysis was done rather than relying only on one indicator as widely used in most studies that cited lack of corruption data. Mo Ibrahim accountability index provides objective data, the hard numbers available on each country key corruption indicators supported by empirical literature at regional and sub-regional levels. Both the CPI and the WGI are widely used and have contributed in awareness-raising in the international trade and FDI. They however do not address corruption as an international problem, because they are based on personal opinions hence being rendered subjective.

All the studies have also concentrated on the regional blocks in the developed nations (Timofeyev, 2014; R´eda & Cam´elia, 2016). It interlinks corruption, public expenditure and economic growth concentrating on EAC region since it is one of the regions ranked highest in corruption levels yet it is the same region that is projected to record better rates of growth in the near future.

2.5 Research Gaps

A number of studies have concentrated on examining the effects of corruption on growth with mainly focusing on regional blocs in developed nations (Gillanders, 2013; Hope, 2014; Wu et al., 2017). However, very few empirical studies have explored the nexus between corruption, government expenditure and economic growth (d'Agostino, et al., 2012:2016; Omoteso & Ishola, 2015;). These studies have been conducted in developed countries and sub-Saharan Africa with little focus on EAC states.

Most of the studies linking corruption, government expenditure and economic growth have not shown lucidly the direct and indirect effect of corruption on growth. Some of these studies are either country level studies (Egunjobi, 2013; Ngutsav, 2018) or biased on one measurement indicator for corruption (Gründler & Potrafke, 2019; Ngutsav, 2018). A comprehensive study using a number of three key corruption indicators supported by empirical literature at regional and sub-regional levels (Mo Ibrahim accountability Index, CPI, and World Governance Indicators) to empirically establish the determinants of corruption and its effect on public expenditure and economic growth is imperative in the region with a view to proposing appropriate policy choices in the wake of various governance reforms as well as increased advocacy for regional integration.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter outlines the methodology adopted in this study. Areas covered in this chapter include the research design, theoretical framework, the empirical model, estimation techniques, data sources, definition and measurement of variables.

3.2 Research Design

The objective of this study was to investigate the determinants and effect of corruption on government expenditure and economic growth in the East African Community states. The study adopted non-experimental research design using panel data for the period 2000-2017 for the five EAC states. This research design has high level of external validity, the findings can be generalized to a larger population and does not involve any manipulation of variables by the researcher.

3.3 Theoretical Framework

The following section provides various theoretical frameworks underpinning the study.

3.3.1 The Determinants of Corruption

This study follows the works of Becker (1968) and Jain (2001). Becker assumes that people act as if they were maximizing expected utility and that utility is a positive function of income. The approach taken here follows the economists' usual analysis of choice and assumes that a person commits an offense if the expected utility to him exceeds the utility he could get by using his time and other resources at other activities. This approach implies that there is a function relating the number of

offenses by any person to his probability of conviction, to his punishment if convicted and to the income available to him in legal or illegal activities. The individual's expected utility $E(U)$ from committing an offense is:

$$E[U] = \rho U(Y_{it} - f) + (1 - \rho)U(Y_{it}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.1$$

Where $U(\cdot)$ is the individual's utility function subjective to the probability of being caught and convicted. Y_{it} is income gain from offenses (corruption) (i.e., the monetary equivalent from an offense), and *f is* the monetary equivalent of the punishment. ρ Is probability of being caught and convicted as given in equation 3.2 and 3.3.

$$\frac{\partial yE[U]}{\partial \rho} = U(Y_{it} - f) - U(Y_{it}) < 0 \quad \text{equivalent to } \frac{\partial C}{\partial \rho} < 0 \ldots\ldots 3.2$$

$$\frac{\partial yE[U]}{\partial f} = -\rho U(Y_{it} - f) < 0 \quad \text{equivalent to } \frac{\partial C}{\partial f} < 0 \ldots\ldots 3.3$$

Where, C^r is number of offenses of (corruption cases).

As long as the marginal utility of income is positive, an increase in either ρ or f would reduce the utility expected from an offense and thus would tend to reduce the number of offenses (corruption) because both the probability of being caught and paying the higher price would increase. This analysis can be expanded by incorporating the costs which is monetary equivalent of the punishment (f) and probabilities of arrests ρ for individuals or society. For individuals or society to indulge in corruption, they make a cost benefit analysis as given in equation 3.4 which in

$$Net\ Social\ Cost = SC(f) - SB(Y_{it}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.4$$

$$SC' > 0 \quad SC'' > 0$$

$$SB' > 0 \; SB'' < 0$$

Where SB is social benefit, SC is the social cost and Y is number of corruption cases. Equation 3.4 shows that if (SC (f) < SB(Y_{it}), the cost of committing an offence is less than the benefit derived from committing an offence (is the net social Benefit), C is the number of crimes (corruption cases) reported/committed. Both SC and SB are related to corruption levels (C) and they change as corruption levels change since$SC'' > 0 \quad SB'' < 0$. If SC (f) < SB (Y_{it}), there is incentive for committing crime (corruption) or illegitimate income is more than the legitimate income. If SC (f) > SB (Y_{it}), there is no incentive for committing crime (corruption) or illegitimate income is less than the legitimate income.

The theory asserts that the amount of crime is determined not only by the rationality and preferences of would-be criminals, but also by the economic and social environment created by public policies, including expenditures on police, punishments for different crimes, and opportunities for employment, schooling, and training program. For the case of this study, Becker's general model for supply of offense function (corruption) is generalized for simplicity by considering averages of these values; P, f, and (Y_{it}), the society legitimate/illegitimate income market offenses (corruption) function as given in equation 3.5

$$C = C(\rho, f, Y_{it}) \quad \ldots\ldots 3.5$$

Where, C is the number of offenses (corruption cases) he would commit during a particu1ar period, ρ is probability of conviction per offense, f his punishment per offense, Y_{it} legitimate/illegitimate income. For individuals to commit crime they make a cost benefit analysis as given in equation 3.4.

In an extension of Becker's (1968) model, Jain (2001) argued that for corruption to occur there must be a discretionary power which includes the authority to enforce regulations, economic rent which include the legitimate versus illegitimate income associated with the discretionary power. The legal system may justify either low or high probability to commission of corruption, low or high apprehension or detection or low or high penalty to deter corruption. The variables are highly related to Becker's as shown in equation 3.6.

$$C = F\left[DP, Y_{it}, \rho, f, \mu\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.6$$

Where C is corruption cases, DP is discretionary powers, Y_{it} is legitimate/illegitimate income (economic rent), P is probability of being detected if convicted, and F is punishment if caught engaging in corruption. μ other variables such as strength of political institutions.

$\frac{\partial C}{\partial DP}>0$ $\frac{\partial C}{\partial Y}>0$ $\frac{\partial C}{\partial \rho}<0$ $\frac{\partial C}{\partial F}<0$ $\frac{\partial C}{\partial \mu}>0$

From notations, given public officials are likely to react to these variables, and when society raises the values of these variables, they are expected to tamper with and systematize their practices of corruption. These are deterrence variables given in Becker's crime model to explain the reduction in corruption. In particular, if ρ, F and μ are increased they will reduce corruption and the remaining variables will enhance corruption.

Corruption will increase if the economic rent associated with the misuse of discretionary power, net illegal payment and penalties are high. The agents will be constrained by the principle or government lack of enforcing rules and monitoring criteria which will give a bureaucratic official lee way to commit corruption or crime.

Discretionary power by bureaucrats will make the agent succumb to corrupt activities (Bliss & Di Tella, 1997). Further, those with discretionary power will be motivated by the capitalist in order to increase the value of their property for rent seeking. According to Rose-Ackerman (2007), the higher the discretionary power which is proxies by weak regulation or lack of government effectiveness level of civil service professionalism, effectiveness of the monitoring and enforcement means the higher corruption cases.

Economic rent according to Jail (2001) is also associated with discretionary powers as determinants of corruption. If the social benefits of corruption are high, there is a greater motivation for engaging in corruption. When the regulations are weak, the economic rent will be higher and the proxy of economic rent may include size of public sector, the GDP per capita (Goel & Nelson, 1998).

Deterrent variables include probability of being detected, convicted and punished when engaging in corruption. These variables are closely related to institutional settings of a country such as strength of political institutions and judicial system.

3.3.2 The Effects of Corruption on Government Expenditure

In order to establish the effect of corruption on government expenditure, this study used a modified and extended model given by Hewitt (1992, 1993), which adopted a public choice framework in analyzing the relationship between military spending and overall government expenditure. The modified model used in this study applies the original framework to analyze the effect of corruption on total government expenditure. The framework begins from the understanding of Government expenditure as given in equation 3.7.

Let overall government spending, G, be an aggregate expenditure from the sectorial spending such as military spending, health spending and education spending as given in equation 3.7

$G = g_{it}$ ……3.7

Therefore, overall government expenditure G Composed of aggregations of various expenditures given as g_{it}

According to Hewitt (1992, 1993) and Sanjeev *et al.*, (2001), government expenditure is financed through taxation and through borrowing (Debt). This suggests that the government budget constraint in period t, (t=0, 1) is given as in equation 3.8 (Beetsma & Bovenberg 1999, 2002).

$G = T + D = T + [d_1 + (1 + r)d_0]$+cπ……..……..….3.8

Where,

G is the government spending in period 1 and cπ is the seigniorage revenue. Debt at time t=1 is stated as, $D_1 = d_1 + (1 + r)d_0$ where D is the accumulated debt, which is the sum of the debt accumulated in the current period (d1) plus the debt of the previous period together with the interest thereon $(1 + r)d_0$ and T is the tax function. If exclude seigniorage cπ, the government budget constraint is approximated as in 3.9:

$G = T + D = T + [d_1 + (1 + r)d_0$ ……..*3.9*

The tax function T, is stated as follows:

$T = \tau Y$ ……*3.10*

$0 \leq \tau \leq 1$

For the sake of this model and simplicity, the assumption that there is no private Investment holds and also time indices is omitted for notational. In order to maximize

the welfare function we assume that it follows a utility function expressed as a Cobb-Douglas utility function in 3.11:

$U(C, g_{it}) = C, g_{it}$ ……..*3.11*

This utility function is assumed to be twice-continuously differentiable on private consumption (C) and government spending (G), with $f\ U > 0$ and $ff\ U < 0$ for *f* = *C*, *G*, where β = (1-α). The corruption free model is founded on the conventional utility maximization problem stated as in maximization equation 3.12

Max

$U(C, g_{it}) = C_{it}^{\alpha} g_{it}^{\beta}$……*3.12*

Subject to

Y = *C* + *G* and *G* = g_{it}

g_{it} is the total government spending by all sectors

Forming a Lagrangian expression 3.13

$L = C_{it}^{\alpha} g_{it}^{\beta} + \lambda(Y - C - g_{it})$ ……3.13

Differentiating equation 3.13 with respect to C, $g_{it}$and l and setting them equal to zero yields equations 3.14, 3.15 & 3.16

$L_C = \alpha C_{it}^{\alpha-1} g_{it}^{\beta} - \lambda = 0$ ……3.14

$L_{g_{it}} = \beta C_{it}^{\alpha} g_{it}^{\beta-1} - \lambda = 0$ ……3.15

$L_{\lambda} = Y - C - g_{it} = 0$ ……3.16

Equating equation 3.14 to equation 3.15 yields equation 3.17

$C = \frac{\alpha}{\beta} g_{it}$……3.17

Substituting 3.17 into 3.16 yields equation 3.18

$$L_\lambda = Y - \frac{\alpha}{\beta} g_{it} - g_{it} = 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.18$$

But we know $G = T + D$, which implies that

$$G_{it} = g_{it} = \tau Y + d_1 + [(1+r)d_0] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.19$$

Substituting equation 3.19 into equation 3.18 yields 3.20

$$Y - \frac{\alpha}{\beta} g_{it} - \tau Y - [d_1 + [(1+r)d_0] = 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.20$$

Solving for g_{it}in equation 3.20 yields the optimal values in equation 3.21

$$g_{it} = \frac{\beta}{\alpha}(1-\tau)Y - \frac{\beta}{\alpha}[d_1 + (1+r)d_0] = 0 \ldots\ldots\ldots\ldots\ldots\ldots 3.21$$

The optimal values of the above problem, which in this case is regarded as a 'corruption free' optimal solution, is gotten by dividing equation by Y to give equation 3.22

$$\frac{g_{it}}{Y} = \frac{\beta}{\alpha}(1-\tau) - \frac{\beta}{\alpha}\left[\frac{d_1}{Y} + \frac{(1+r)d_0}{Y}\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.22$$

In equation 3.22, for any given tax rate τ, the proportion of total government expenditure and income, depends on the parameters of the utility functionsα and β. This therefore, suggests that a higher β relative to α, leads to an increase in government expenditure in relative to consumption.

According to Sanjeev *et al.* (2001), the effect of corruption on the structure of the public budget can be studied via its effect on the parameters of equations 3.22.

The relationship between corruption and total government expenditure is given as in equation 3.22: Let the parameters of the utility function, α and β be affected by corruption ρ such that equation 3.22 become 3.23

$$\frac{g_{it}}{Y} = \frac{\beta}{\alpha}\frac{\rho}{\rho}(1-\tau) - \frac{\beta}{\alpha}\frac{\rho}{\rho}\left[\frac{d_1}{Y} + \frac{(1+r)d_0}{Y}\right] \ldots\ldots\ldots\ldots\ldots\ldots 3.23$$

Differentiating equation 3.21, with respect to corruption ρ, yield equation 3.24

$$\frac{\partial(g_{it})/Y}{\partial\rho} = (1-\tau)\left[\frac{\beta_\rho\alpha - \alpha_\rho\beta}{\alpha^2}\right] - \left[\frac{d_1}{Y} + \frac{(1+r)d_0}{Y}\right]\left[\frac{\beta_\rho\alpha - \alpha_\rho\beta}{\alpha^2}\right] \ldots\ldots\ldots 3.24$$

Where $\beta_\rho = \frac{\partial\beta}{\partial\rho}$, $\alpha_\rho = \frac{\partial\alpha}{\partial\rho}$, $\frac{\partial(g_{it})/Y}{\partial\rho} > 0$, $if\ \frac{\beta_\rho}{\beta} < \frac{\alpha_\rho}{\alpha}$

In equation 3.25, corruption affects the parameters in the utility function causing higher g_{it} government expenditure:

$$\frac{g_{it}}{Y} = f_1\left(\alpha, \beta, v, \frac{D}{Y}\right) \ldots\ldots\ldots\ldots 3.25$$

Further modification of the equation 3.23 by inclusion of Y as an exogenous variable in line with Wagner and Weber (1977), who view national income as one of the determinants of government expenditure, making government size an endogenous factor. An increase in per capita income is accompanied by increase in government expenditure. This is symbolically expressed in the following equation:

$$G = f(Y) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.26$$

Where, G is the government expenditure and Y represents income. The present study proceeds to formulate the model of public expenditure by modifying equation 3.25 by incorporating income and other control variables as shown in equation 3.27

$$\frac{g_{it}}{Y} = f_1\left(\alpha, \beta, \tau, \frac{D}{Y}, Y\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.27$$

Because α, β, τ and ρ are not directly observable, the impact of corruption on the total government spending category can be estimated. Equation 3.28 enables us to understand the role of corruption on total government expenditure and GDP.

$$\frac{g_{it}}{Y} = \alpha_0 + \alpha_1\rho - \alpha_1\frac{D}{Y} + \alpha_1 Y_{it} + \alpha_1 K_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.28$$

t is a time index and j indexes the countries in the panel, $Y_{it}$is the GDP, $g_{it}$is the total of government expenditure to the GDP, $\rho_{it}$is a corruption indicator, $D_{it}$is ratio of the public debt to the total public budget and the GDP, $K_{it}$is a vector of the control variables and ε_{it} is the error term.

3.3.3 The Relationship between Corruption and Economic Growth

In order to investigate the growth effect of corruption on economic growth the classical work of Solow (1956) and Mankiw, Romer & Weil (1992 was used. These models were further modified by Nonneman & Vanhoudt, (1996), Polimeni, Polimeni &Trees (2007) and Próchniak (2013 to include corruption as an institutional variable. The Solow model in the Cobb-Douglas form is given in equation 3.29:

$$Y_{it} = F[A_t K_t L_t] = A_{it} K_{it}^{\alpha} L_{it}^{1-\alpha} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.29$$

Where $0 < \alpha < 1$

Y is the aggregate level of real income, K is the level of physical capital, L is the amount of labor employed, and A denotes total or multifactor productivity or technological progress. In the Solow model, output, physical capital, labour and technological progress in a country explain its economic development. While saving rate, population growth are exogenous variables.

Considering the extended Solow model with human capital, Mankiw, Romer and Weil (1992) presented as shown in equation 3.30;

$$Y_t = F[K_{it}H_{it}A_{it}G_{it}L_{it}] = K_{it}^{\alpha}H_{it}^{\beta}A_{it}L_{it}^{1-\alpha-\beta} \ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.30$$

Where $0 < \alpha + \beta < 1$

Where Y_{it} is the aggregate level of real income, K_{it} is the level of physical capital, H_{it} is the level of human capital, L_{it} is the amount of labour employed, and time is given as continuous variable (t). The model is equivalent to the neoclassical Solow model, but the growth rate of output is determined by additional variables (human capital). Population or labour force is exogenously determined $\boldsymbol{L_{it} = L_0 e^n}$ so that population growth is constant over time $\frac{dL}{dt}L_{it} = n$. assuming full employment implies that labour force growth rate is also given by n. The technological progress factor is constant overtime and evolves as;

$\boldsymbol{A_{it}} = \mathrm{A}(0)\mathrm{e}^{\sigma t}$ Where σ is the growth rate of technological progress and the production function exhibits decreasing returns to scale for each of the production inputs. That is $0 < \alpha + \beta < 1.$

The intensive form production function and evolutions for physical, human and per unit of effective worker is given in equations (3.31), (3.32) and (3.33).

$$\dot{y}_{it} = \dot{k}_{it}^{\alpha}\dot{h}_{it}^{\beta} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.31$$

$$\frac{dK}{dt} = \dot{k}_{it} = s_k\dot{y}_{it} - (n + \sigma + \omega_k)\dot{k}_{it} = s_k\dot{k}_{it}^{\alpha}\dot{h}_{it}^{\beta} - (n + \sigma + \omega_k)\dot{k}_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.32$$

$$\frac{dh}{dt} = \dot{h}_{it} = s_h\dot{y}_{it} - (n + \sigma + \omega_k)\dot{h}_{it} = s_k\dot{k}_{it}^{\alpha}\dot{h}_{it}^{\beta} - (n + \sigma + \omega_k)\dot{h}_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.33$$

Where, $\dot{y}_{it} = \frac{Y}{A_{it}L_{it}}$ is output per capita, $\dot{k}_{it} = \frac{K}{A_{it}L_{it}}$ is physical capital per capita and $\dot{h}_{it} = \frac{H}{A_{it}L_{it}}$ is human capital per worker. $S_k \; and \; S_h$ are parameters that represent, respectively, shares of income that are allocated to physical capital and human capital. While $\omega = \omega_k = \omega_h$ is depreciation rate of physical capital and human. Depreciation for all inputs is constant. At the steady state, equations (3.31), (3.32) and (3.33) are equal to zero. Hence the system of three equations in three unknowns are equal to zero. Solving for steady state physical, human capital and production function gives equation 3.34, 3.35 and 3.36

$$k_{it}^{*} = [\frac{S_k}{n+\sigma_K+\omega}]^{(1-\beta)/1-\alpha-\beta)}[\frac{S_h}{n+\sigma_K+\omega}]^{(\beta)/1-\alpha-\beta)} \dots\dots 3.34$$

$$h_{it}^{*} = [\frac{S_k}{n+\sigma_K+\omega}]^{(\alpha)/1-\alpha-\beta)}[\frac{S_h}{n+\sigma_K+\omega}]^{(1-\alpha)/1-\alpha-\beta)} \dots\dots 3.35$$

Equations (3.34) and (3.35) indicate that steady-state capital increases with higher levels of saving and decreases with higher rates of population growth and depreciation of all forms of capital. Substituting (3.34) and (3.35) into (3.31) results in a steady state equation for output per capita or production function as given in equation (3.36).

$$y_{it}^{*} = [\frac{S_k}{n+\sigma_K+\omega}]^{(\alpha)/1-\alpha-\beta)}[\frac{S_h}{n+\sigma_K+\omega}]^{(\beta)/1-\alpha-\beta)} \dots\dots 3.36$$

Substituting this into equation (3.31), multiplying by g_{it} and taking natural logs yields equation (3.37)

$$\begin{aligned} Ln\frac{Y_{it}}{L_{it}} = Ln(A_{it0}) + \sigma_{it} - [(\alpha+\beta)/1-\alpha-\beta)ln(n+\sigma_K+\omega)] \\ + (\alpha)/1-\alpha-\beta)lns_k \\ + (\beta)/1-\alpha-\beta)lns_h \dots\dots\dots\dots\dots\dots\dots\dots 3.37 \end{aligned}$$

Where, $(\alpha+\beta)/1-\alpha-\beta)$ is the elasticity of output with respect to (n + g +δ), $(\alpha)/1-\alpha-\beta)$ is the elasticity with respect to s_k, and $(\beta)/1-\alpha-\beta)$ is the elasticity with respect to s_h.

Equation 3.35 states that income per worker is dependent on population growth, accumulation of physical capital and accumulation of human capital.

Nevertheless, the MRW model still does not provide a deep understanding of economic growth. This study incorporates corruption (proxy of institutions) to the extended Mankiw, Romer and Weil (1992) model. North (1990) argued that institutions in a country determine its long-run economic performance. Gregorian and Martinez (2000) and Breton (2002) further augment the Solow growth model by introducing variables for institutions. The introduction of institutions is also shown by Nonneman & Vanhoudt (1996), Polimeni, Polimeni &Trees (2007) and Próchniak (2013). The production function now is given in equation 3.38.

$$K_{it}^{\alpha}H_{it}^{\beta}\ J_{it}^{\varsigma}[A_{it}L_{it}^{1-\alpha-\beta}] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.38.$$

Where J_{it}^{ς} is a matrix of corruption or institutional measures that reflect the extent to which institutions affect economic growth. Corruption as an institutional variable is assumed to be constant. From this, capital per effective unit of labor and human capital per effective unit of labor is defined as in equation 3.39 and 3.40

$$\frac{dK}{dt} = \dot{k}_{it} = s_k\dot{y}_{it} - (n+\sigma+\omega_k)\dot{k}_{it} = s_k\dot{k}_{it}^{\alpha}\dot{h}_{it}^{\beta}J_{it}^{\varsigma} - (n+\sigma+\omega_k)\dot{k}_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\

$$\frac{dh}{dt} = \dot{h}_{it} = s_h \dot{y}_{it} - (n + \sigma + \omega_k)\dot{h}_{it} = s_k \dot{k}_{it}^{\alpha} \dot{h}_{it}^{\beta} J_{it}^{\varsigma} - (n + \sigma + \omega_k)\dot{h}_{it} \ldots\ldots\ldots\

The model is also a decreasing function of population growth and depreciation, implying that a country with higher population growth and high depreciation rate has less capital and income per worker. This model differs from the classical Mankiw, Romer and Weil (1992), and hereafter will be referred to as an extended MRW because of the inclusion of an institutional variable (corruption).

3.4 Empirical Models

3.4.1 Empirical Model for the Determinants of Corruption

This section addresses the first objective which is to investigate the determinants of corruption in EAC states. The empirical model extends the policy-oriented theory of corruption given by Jain (2001) and Charles (1986) by including other independent variables that determine corruption as identified from the theoretical review in section 3.3. In this study, the rule of law (RL) and government effectiveness provided such a proxy of measuring discretionary power (DP) and probability of apprehension (P).

The economic rent, which is the net benefit from corruption, is hard to measure because of the nature of secrecy that is involved in corruption, but other economic variables that possibly determine the levels of corruption include economic growth and capital formation act as proxy. Further, UNECA (2016) report support Becker's assertion by arguing that corruption is a subject of activities, through State regulatory procedures, governance policies, spending policies and decisions, and other discretionary decisions, which influence the behaviour of other actors such as the private sector and individuals.

Similarly, State capacity, through the quality of its bureaucracy, level of public sector wages, nature of institutional controls and penalty systems and leadership quality,

determine the level of corruption. Equation 3.5 is modified to include more variables as given in equation 3.45:

$$Corruption_{it} = \beta_0 + \beta_1 \text{Lagged } Corruption_{it} + Growth_{it} + \beta_2 Human_{it} + \beta_3 Politics_{it} + \beta_4 Effectiveness_{it} + \beta_5 Rule_{it} + \beta_6 Capital_{it} + \beta_6 Gini\ Index_{it} + \beta_6 \text{Estability} + \varepsilon_{1it}$$

.....3.45

Where i=1…N, t=1…T, β_0 and $\beta_1$to β_6 are parameters to be estimated, while ε_{1it} represents disturbance terms. $Corruption_{it}$ Include corruption levels, measured by control of corruption, corruption perception index and Mo Ibrahim Index.

3.4.2 Empirical Model for Effect of Corruption on Government Expenditure

To address the second objective, the empirical model was determined. Equation 3.26 was modified so that government expenditure becomes a dependent variable and economic growth an explanatory variable. The rationale behind this was that one major channel through which corruption affects economic growth is government expenditures. To measure the effect of corruption on government expenditure in the East Africa countries the study extended the model given in equation 3.28 by including control variables as given in equations 3.46

$$GE_{it} = \beta_0 + \beta_1 lagged\ Expenditure_{it-1} + \beta_2 Growth_{it} + \beta_3 \text{revenue} + \beta_4 \text{trade}_{it} + \beta_5 Politics_{it} + \beta_6 debt_{it} + \beta_7 \text{corruption}_{it} + \beta_8 \text{capital}_{it} + \varepsilon_{2it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$$

3.46

Where

i=1…N, t=1…T, β_0 and $\beta_1$to β_6 are parameters to be estimated, while ε_{1it} represents disturbance terms. $Corruption_{it}$ Include corruption levels, measured by control of corruption, corruption perception index and Mo Ibrahim Index.

3.4.3 Empirical Model for Effects of Corruption on Economic Growth

To address the third objective, the theoretical model given in equation 3.44 for effect of corruption on economic growth was extended to include other variables of interest. To measure the effect of corruption on economic growth in the East Africa countries, the study extended the steady state model given in equation 3.44 by including control variables as given in equations 3.47 to establish the effect of corruption on economic growth.

$$Growth_{it} = \beta_0 + \beta_1 Lagged\ Growth_{it} + \beta_1 Expenditure_{it} + \beta_2 + \beta_3 Debt_{it} + \beta_4 \text{Revenue}_{it} + \beta_5 trade_{it} + \beta_6 Corruption_{it_{it}} + \beta_6 Capital_{it} + \varepsilon_{3it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad 3.47$$

Where i=1…N, t=1…T, β_0 and $\beta_1$to β_6 are parameters to be estimated, while ε_{1it} represents disturbance terms. $Corruption_{it}$ include corruption levels, measured by control of corruption, corruption perception index and Mo Ibrahim Index.

This is the direct effect of corruption on economic growth. The choice of variables and estimation methodology was based on the action of the public power as a determinant of corruption and the triangular relationship of corruption, government expenditure and economic growth. To achieve this, three simultaneous equations model was used, similar to the works of Abderraouf (2015).

The study established the determinants of corruption with key focused on the action of public power which includes rule of law and government effectiveness. It also looked at other economic determinants such as economic growth, human capital, and capital formation. The study endeavored to establish the direct and indirect effects of corruption through government expenditure on economic growth. It adopted the use

of the three simultaneous equation models given in equation 3.45, 3.46 and 3.47 respectively:

$$Corruption_{it} = \beta_0 + \text{Lagged } Corruption_{it} + Growth_{it} + \beta_2 Human_{it} + \beta_3 Politics_{it} + \beta_4 Effectiveness_{it} + \beta_5 Rule_{it} + \beta_6 Capital_{it} + \beta_7 Gini\ Index_{it} + \beta_8 \text{Estability} + \varepsilon_{1it} \ldots\ldots\ldots\ldots \quad 3.45$$

$$Expenditure_{it} = \beta_0 + \beta_1 lagged\ Expenditure_{it-1} + \beta_2 Growth_{it} + \beta_3 \text{revenue} + \beta_4 \text{trade}_{it} + \beta_5 politics_{it} + \beta_6 debt_{it} + \beta_7 \text{corruption}_{it} + \beta_8 \text{capital}_{it} + \varepsilon_{2it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad 3.46$$

$$Growth_{it} = \beta_0 + \beta_1 Lagged\ Growth_{it} + \beta_2 Expenditure_{it} + \beta_3 Debt_{it} + \beta_4 \text{Revenue}_{it} + \beta_5 trade_{it} + \beta_6 Corruption_{it_{it}} + \beta_6 Capital_{it_{it}} + \varepsilon_{3it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad 3.47$$

(i = 1 . . . 5; N =45; t = 1 . . . 17, while ε_{1it} represents disturbance terms, a fixed effect part, $\boldsymbol{v}_i$ and an idiosyncratic term εit.

First, the study started with the equation of determinants with critical focus on institutional or public power (rule of law and government effectiveness) and other economic variables. Second, the study focused on how corruption affects government expenditure, which is a transmission mechanism to growth. Finally the study focused on the effect of corruption on growth with government expenditure as an explanatory variable.

3.5 Model Estimation – Dynamic System Generalized Methods of Moments

According to Nerlove (2002) most economic relationships are dynamic in nature. This means that past values of variables have effect on current outcome values of a variable. As such, the past effect of variables cannot be ignored since this will lead to potential loss of important information, which will result into biased estimation. This

study uses a set of panel data from member countries of the East African Economic Community States. Therefore, based on the foregoing argument, the choice of a dynamic panel data model is more appropriate because this allows a better understanding of the dynamics in the region.

In order to estimate the coefficients of the empirical models presented above, the study used the dynamic system generalized method of moments (SGMM) estimation procedure described in Schultz, Tan and Walsh (2010). The dynamic system GMM was based on Arellano & Bover (1995) and Blundell & Bond (1998) who developed a system of simultaneous difference and level equations within the GMM framework which under certain conditions, yield more efficient, consistent and asymptotically more efficient estimators than the dynamic difference GMM developed by Arellano and Bond (1991).

Applying this procedure necessitates each of the equations (3.45), (3.46) and (3.47) to each form a system of equations composed of a difference equation and a level equation taking the general form given in equation (3.48) and (3.49):

$$Y_{i,t} = \beta 1 Y_{i,t-1} + \beta 2 X_{it} + \omega W_{it} + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.46$$

$$\Delta Y_{i,t} = \beta 1 \Delta Y_{i,t-1} + \beta 2 \Delta X_{it} + \omega \Delta W_{it} + \Delta \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.47$$

Where $\varepsilon_{i,t} = \mu_i + v_{i,t}$

Where β is a column vector of coefficients, $y_{i,t}$ is the current value of dependent variable, $y_{i,t-1}$ is the lag value of dependent variable, X is a column vector of K potentially endogenous regressors across N observations at time period t, W_{it} is column vector of a matrix of the control variables i at time period t; the disturbance term εit has two orthogonal components which are the fixed effects, ui, and the

idiosyncratic shocks,$vit;\ \beta 1, \beta 2,$ and ω are parameters to be estimated, Δ is the time-differencing operator.

The dynamic system GMM augments the Moments conditions in the dynamic differenced GMM by instrumenting the levels of the relationship of interest with the lagged differences of all the regressors in the system. For endogenous variables, the lagged differences are available as valid instruments. Moreover, the current and lagged changes in the exogenous variables are valid instruments. An assumption must be imposed that the correlations between the regressors and the individual fixed-effects are constant throughout the sample period.

The dynamic system GMM specification procedure is robust to all sources of potential endogeneity. First, is the dynamic endogeneity where a dependent variable's current value is influenced by its previous value in the preceding time period. Second, simultaneity where two variables are co-determined, such that each variable may affect the other simultaneously and lastly unobserved heterogeneity where a relation between two or more variables is affected by an unobservable factor-country fixed-effect—may affect a dependent variable (Schultz, Tan & Walsh, 2010).

3.6 Definition and Measurement Variables

Control of Corruption Index: Reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as state capture by elites and private interests. It is measured on a scale of -2.5 to 2.5 where -2.5 indicates highly corrupt state and 2.5 showing less corrupt state.

Corruption Perception Index: It is corruption rank of countries/territories by Transparency International based on how corrupt the country is perceived to be. It is a composite index, a combination of surveys and assessments of corruption, collected by a variety of reputable institutions. It is ranked 1-100 where 1 is the most corrupt country and 100 is the least corrupt country.

Mo Ibrahim Index: It is corruption measure of countries by Mo Ibrahim accountability index based on how corrupt the country is perceived to be. It is a composite index, a combination of surveys and assessments of corruption, collected by a variety of reputable institutions. It is ranked 1-100 where 1 is the most corrupt country and 100 is the least corrupt country.

Economic Growth (GDP): This is the annual change in value of goods and services produced in a country. It is measured by annual GDP Growth.

Government Expenditure: Government expenditure consists of total expense and the net acquisition of non-financial assets. It is measured as annual growth of government expenditure.

Trade Openness (Trade): This is a measure of economic gains of a country in engaging in international trade. It is the value of exports and imports of countries. It is computed as exports plus imports as a share of GDP.

Human Capital: This incorporates skills, knowledge, competencies and attributes in individuals that lead to improvement of personal, social and economic well-being. It is captured as education index as given in the human development indicators.

Gross Capital formation: This includes land improvements (fences and drains), machinery, plant and equipment purchases and infrastructure construction. This study uses the annual growth rate of fixed capital formation by World Bank indicators

Political Stability: It is the propensity of government collapse either due to conflicts or rampant competition between various political parties or because of government changes or violence/terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. It is measured as political stability/absence of violence as measured by World Bank indicators. It is estimated in a scale ranging from -2.5 (weak) to 2.5 (strong) by worldwide governance indicators.

Rule of Law: Reflects perceptions of the extent to which agents have confidence in and abide by the rules of society. It is measured in a scale ranging from -2.5 (weak) to 2.5 (strong) by worldwide governance indicators.

Government Effectiveness: Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Eestimated on a scale ranging from -2.5 (weak) to 2.5 (strong) by worldwide governance indicators.

Debt: It is the gross amount of government liabilities owed to creditors outside the country. It is measured as debt annual growth.

Gini Index: Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an

economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

Revenue: Tax revenue refers to compulsory transfers to the central government for public purposes. Certain compulsory transfers such as fines, penalties, and most social security contributions are excluded. It is measured as annual revenue growth.

3.7 Data Type and Sources

This study used published secondary data on corruption, government expenditure and economic growth for five EAC states for the period 2000-2017. The data sources included the World Bank development indicators, IMF publications, Mo Ibrahim index of governance, Transparency International for corruption perception index, and world governance indicators for control of corruption. The choosing of the indices are not only timely and supported by empirical literature at regional and country levels, but also address imperfections of any single approach (UNECA, 2016).

3.8 Data Analysis

Once data was collected, it was entered in excel for cleaning before it was exported to advanced software (Stata 15 & Eviews 20) for further analysis. To achieve objective one: determinants of corruption, equation 3.19 was estimated. Objective two and three investigated the effect of corruption on Government expenditure and economic growth. This was achieved through estimating equation (3.20) and (3.21) respectively.

3.9 Panel Data Unit Root Test

To avoid spurious regressions, stationary time series in panel data set was required. Panel data unit root tests were conducted to rule out the existence of non-stationary time-series, individual or common unit roots. The study employed Levin, Lin & Chu (2002) because these tests are less restrictive and are powerful and permit to solve serial correlation problem by assuming heterogeneity between units in a dynamic panel framework.

According to Levin, Lin and Chu, (2002), Im, Pesaran & Shin (2003) and Laura (2009) the test allows for heterogeneity of individual deterministic effects (constant and/or linear time trend) and heterogeneous serial correlation structure of the error terms assuming homogeneous first order autoregressive parameters. They assume that both N and T tend to infinity but T increase at a faster rate, such that $N T \rightarrow 0$.

The null and alternative hypotheses tested in the study for stationarity were:

H_0: $\rho = 0$ Panels contain unit roots

H_1: $\rho < 0$ Panels are stationary

If the computed t-statistics is greater than the asymptotic critical values in absolute terms, the null hypothesis that the series contained unit root was rejected and the series was concluded to be stationary (Gujarati, 2004).

3.10 Post Diagnostic Test

Before estimation and interpretation of the results so as to answer the objectives of the study, various time series properties were conducted. This was to ensure that spurious results would not result (Gujarati, 2009).

3.10.1 Multicollinearity Tests

Multicollinearity results when some independent variables in a regression model are linearly correlated to each other. According to Gujarati (2004), multicollinearity cannot be completely eliminated since non-experimental data will never be orthogonal. Multicollinearity is a problem when small changes in the data cause big changes in the regression coefficients. Another indicator of this problem is when the standard errors of coefficients are very high but the levels of significance are low and the overall fit of the model is good. To deal with this problem one can decrease the dataset by deleting redundant variables causing high relationship with another variable(s) or increase the sample size thus increasing the data observations.

This study tested for multicollinearity between the independent variables by undertaking, correlation analysis using a pair wise matrix to determine the degree of correlation between the study's variables as well as Variance Inflation Factors (VIF) to avoid serious multicollinearity problem that could undermine the effective use of the models in the analysis.

3.10.2 Serial Correlation Test

If there is a problem of serial correlation, it means that errors are correlated. According to Green (2012), autocorrelation may occur if relevant variables are omitted from a regression or some included variables are correlated across periods which may yield inefficient estimates as well as rejection of the null hypothesis when it is actually true. The Arellano and Bond (1991) correlation test was used. According to Arellano and Bond (1991), the GMM estimator allows for first-order serial correlation but requires that there is no second-order serial correlation in the residuals. The null hypotheses in diagnostics test (1) and (2). The full disturbance term

$\varepsilon_{it} = [u_i + v_{i,t}]$ contains fixed effects and is presumed auto correlated and so the estimators are designed to remove this source of problem. If ε_{it} is serially independent,

then: $E(\Delta\varepsilon_{i,t}\Delta\varepsilon_{i,t-1}) = E[(\varepsilon_{it} - \varepsilon_{i,t-1})(\varepsilon_{it} - \varepsilon_{i,t-2})] = -E(\varepsilon_{i,t-12}) = -\sigma\varepsilon^2$ This means that first order serial correlation would be present, but not in second order serial correlation. $E(\Delta\varepsilon_{i,t}\Delta\varepsilon_{i,t-2}) = E[(\varepsilon_{it} - \varepsilon_{i,t-1})(\varepsilon_{it-2} - \varepsilon_{i,t-3})] = 0$.

Based on the same reasoning, the test for second order serial correlation was carried out. The idiosyncratic disturbance term V_{it} is related to ΔV_{it-1} and thus a negative first-order serial correlation was expected in differences. Roodman, (2009) asserts that to check for first-order serial correlation in levels, it is necessary to check for second-order correlation in differences so as to detect correlation between the V_{it-1} in ΔV_{it} V_{it-2} in ΔV_{it-2}. These tests lose power when the number of instruments, i, is large relative to the cross section sample size, n. The rule of thumb is to keep the number of instruments less than or equal to the number of groups.

3.10.3 Over Identification/Sargan Test

The assumption of exogeneity of instruments used in system GMM is crucial. To test for identification of restrictions, the standard Sargan test was used. The Sargan test is best suited and reliable if errors are homoscedastic. The instruments must be orthogonal to the error term, the instrument only indirectly influences dependent variable and correlates strongly with the variable for which they are used for as instruments. Roodman (2007) strongly suggests that one should report the number of instruments used in the dynamic panel, since those models can generate a possible number of weak instruments. The study asserts that there are no clear rules concerning how many instruments are “too many”, but some rules of the thumb that the number

of instruments should not exceed the number of observations should be used. At the same time, the p-value should have a higher value than the conventional 0.05 or 0.10 levels.

3.10.4 The F-test of Joint Significance Tests

Roodman (2009) explains that a test statistic for the joint validity of the moment conditions is well specified, if the model is not well specified, because the model is over identified. Wald Chi-square test of joint significance of the variables was used to test if the model was well specified.

CHAPTER FOUR

EMPIRICAL FINDINGS

4.1 Introduction

This chapter presents the study findings. It starts with descriptive statistics, the results of time series property tests and diagnostic tests of the models estimated. The empirical findings are presented and discussed as per the study objectives.

4.2 Descriptive Statistics

The descriptive statistics reveal the salient features of the variables used in the study. The descriptive statistics for variables used in this analysis are the measures of central tendency and measures of dispersions. The study variables under investigation included economic growth, government expenditure, control of corruption, corruption perception index, Mo Ibrahim index, rule of law, government effectiveness, revenue, debt, aid, trade openness, Gini index, inflation, capital formation, human capital and political stability.

4.2.1 Descriptive Statistics for East African Community

The descriptive statistics are presented in Table 4.1.

Table 4.1: Summary of Descriptive Statistics for the Study Variables

Region	Variable	Mean (Std Dev)	Minimum	Maximum	Obs.
EAC	Economic growth	5.90 (2.44)	1.715	10.84	45
	Government expenditure	22.69 (6.87)	12.26	40.06	45
	Control of corruption	-0.754 (.299)	-1.095	0.14	45
	Corruption perception index	26.922 (4.907)	19	35	45
	Mo Ibrahim index	40.031 (8.387)	24.55	57.25	45
	Rule of law index	-0.7963 (0.3729)	-1.57	-0.31	45
	Government effectiveness Index	-0.610 (0.3783)	-1.398	0.177	45
	Revenue growth	20.063 (5.761)	12.315	37.952	45
	Debt	53.04681 (34.92)	19.501	165.529	45
	Trade openness	24.179 (11.749)	10.524	48.542	45
	Gini index	42.737 (3.436)	36.45	47.5	45
	Inflation	7.637 (3.86)	0.811	17.48	45
	Capital formation	19.4932 (6.470)	10.21	32.462	45
	Human capital	0.3720 (0.0848)	0.1865	0.489	45
	Politics	-1.187 (0.578)	-2.415	-0.07	45

Source: Study Data (2019)

From Table 4.1, the mean of economic growth was 5.90 meaning that the economy in EAC has been growing at a rate of 5.90 percent. The standard deviation of economic growth was 2.44. The maximum and minimum for economic growth were 10.84 and 1.71 respectively. These results reveal that, the spread of each of the 45 observations from the true mean (5.90) of the same observations as measured by the standard

deviation (2.44) is greater than as envisaged in the normal curve distribution. This means that, the economic growth variable observations in this study has greater variability from their true mean.

The mean of government expenditure was 22.69 with a corresponding standard deviation of 6.87. The maximum government expenditure and minimum government expenditure across the 45 study observations was established at 40.03 and 12.26 respectively. The implicit range was established to be 0.29. The standard deviation of government expenditure is far greater than one, implying that the variability of government expenditure across the East African Community countries is greater.

Control for corruption mean was established to be -0.754. The standard deviation of the control for corruption variable was found to be 0.299. The maximum, minimum and the range was established to be 0.14, -1.059 and -0.919 respectively. These results reveal that, the spread of each of the 45 observation from the true mean (-0.754) of the same observations as measured by the standard deviation (0.299) is far less than as envisaged in the normal curve distribution.

Corruption perception index mean was established to be 26.922. The standard deviation of the corruption perception index variable was found to be 4.907. The maximum, minimum and the range was established in the study to be 35, 19 and 16 respectively. These results reveal that, the spread of each of the 45 observation from the true mean (26.922) of the same observations as measured by the standard deviation (4.907) is far greater than as envisaged in the normal curve distribution.

The mean for Mo Ibrahim index was established be 40.031. The standard deviation of the Mo Ibrahim index was found to be 8.387. The maximum, minimum and the range

were 57.25, -24.55 and 22.70 respectively. From these results, the study standard deviation was established at 8.387 which is far greater than the heuristic (+/ - 1σ) standard deviation for normal curve distributions. The mean of rule of law was -0.7963. The standard deviation of the rule of law variable was 0.373. The maximum, minimum and the range were -0.31, -1.57 and -1.88 respectively. These results reveal that, the spread of each of the 45 observation from the true mean (-0.7963) of the same observations as measured by the standard deviation (0.3729).

The mean of government effectiveness was -0.610. The standard deviation of the government effectiveness variable was 0.3783. The maximum, minimum and the range were 0.177, -1.398 and 1.575 respectively. These results reveal that, the spread of each of the 45 observation from the true mean -0.610 of the same observations as measured by the standard deviation 0.3783 is far less than as envisaged in the normal curve distribution. This means that, the government effectiveness variable observations in this study has far less variability from their true mean. The range of 1.575 shows that the difference between the maximum and minimum of the 45 study observations, was not substantial.

The revenue mean was 20.063. The standard deviation of the revenue was 5.761. The maximum, minimum and the range were 37.952, 12.315 and 25.637 respectively. These results reveal that, the spread of each of the 45 observation from the true mean -1.610 of the same observations as measured by the standard deviation 5.761 is far greater than as envisaged in the normal curve distribution that envisages the standard deviation of observations to be (+/ - 1σ). This means that, the revenue variable observations in this study has far greater variability from their true mean. The range

of 25.637 shows that, the difference between the maximum and minimum of the 45 study observations is substantial.

The mean of debt was 53.04. The standard deviation of the debt variable was 34.92. This means that the debt variable has far greater variability from its true mean. The maximum, minimum and the range were 165.53, 19.50 and 146.03 respectively. These results reveal that, the spread of each of the 45 observation from the true mean 53.04 of the same observations as measured by the standard deviation 34.92.

The mean for trade openness was 24.179. The standard deviation of the trade openness variable was 11.749. The maximum, minimum and the implicit range were 48.542, 10.524 and 38.018 respectively. These results reveal that, the spread of each of the 45 observation from the true mean 24.179 of the same observations as measured by the standard deviation 11.749 is far greater than as envisaged in the normal curve distribution. This means that, the trade openness variable has far greater variability from its true mean of 38.018.

The Gini index mean was 42.737. The standard deviation of the Gini index variable was 3.436. The maximum, minimum and the range were 47.5, 36.45 and 11.05 respectively. These results reveal that, the spread of each of the 45 observations from the true mean 42.737 of the same observations as measured by the standard deviation 3.436 is far greater than as envisaged in the normal curve distribution. This means that, the Gini index variable has far greater variability from its true mean.

The mean of inflation was 7.637. The standard deviation of inflation was 3.86. The maximum, minimum and the range were 17.48, 0.811 and 16.669 respectively. The capital formation mean was 19.4932. The standard deviation of capital formation was

6.470. The maximum, minimum and the range were 32.462, 10.21 and 22.252 respectively. The mean of human capital was 0.3720. The standard deviation of human capital was 0.0848. The maximum, minimum and range were 0.489, 0.1865 and 0.304 respectively. The mean of political stability was -1.187. The standard deviation of the politics stability was 0.578. The maximum, minimum and range were -0.07, -2.415 and -2.485 respectively. Based on the above analysis, it is evident that the data distribution for this study did not assume a normal distribution but assumed largely a positive skew distribution with standard deviations of most of the variables being larger than +1.

4.2.2 Descriptive Statistics for Each of EAC Country

The standard deviation was used to show the variability of the study variables across the East Africa Community countries comprising of Kenya, Tanzania, Uganda, Rwanda and Burundi. From Table A4.2, in appendix 2, economic growth standard deviation for Burundi had the greatest variability as established by a standard deviation of 8.66, followed by that of Uganda at 8.38, Rwanda at 2.77, Kenya d at 2.9 and Tanzania at 1.48 respectively. However, all the countries had greater variability as their respective standard deviations were established to be greater than that of the East Africa Community that was at 1.84, except for Tanzania.

The corruption perception index standard deviation for Uganda was greatest at 4.94, followed by that of Kenya at 4.38, Tanzania at 4.41, Burundi at 2.49 and Rwanda at 2.17 respectively. However, all the countries had greater variability in corruption perception index as their respective standard deviations were less than that of the East Africa Community, except for Uganda that had a standard deviation of 4. 94.

The Mo Ibrahim index standard deviation for Burundi was the highest at 2.49, followed by that of Tanzania at 2.09, Rwanda at 1.87, Uganda at 2.9 and Kenya at 0.66 respectively. However, all the countries had lower Mo Ibrahim index standard deviations than that of the East Africa Community that of 8.38.

The corruption control standard deviation for Rwanda had the highest standard deviation of 0.32, followed by that of Tanzania at 0.26, Kenya at 0.07, and Burundi at 0.05 and Uganda at 0.048 respectively. However, all the countries had lesser variability as their respective standard deviations were less than that of the East Africa Community of 0.299 except for Rwanda whose standard deviation was 0.32.

The government expenditure for Rwanda had the greatest variability as established by a standard deviation of 6.62. It was followed by that of Kenya at 5.13, Burundi at 3.84, Tanzania at 3.12 and Uganda at 1.29 respectively. Except for Tanzania and Uganda, all the East African countries had greater government expenditure variability as their respective standard deviations were greater than that of the East Africa Community of 3.87.

Mo Ibrahim index for Burundi had the greatest variability given by a standard deviation of 2.49, Tanzania, Rwanda, Uganda and Kenya had a standard deviation of 2.09, 1.87, 0.72 and 0.66 respectively. Other cross-country study variables mean and standard deviation distributions are shown in Table A4.2 in appendix 2.

4.3 Panel Unit Root Properties Test

Before estimation and interpretation of the results various time series properties were conducted. This was to ensure that spurious results would not result (Gujarati, 2009). The study employed Levin, Lin and Chu (2002) to affirm stationarity of variables

under study. The findings of the test are shown in Appendix 4, Table A4.5, the study rejected the null hypothesis of presence of unit root at level.

The study concluded that Gini index, rule of law and revenue were stationary at level or integrated of order zero I (0). Economic growth, Mo Ibrahim accountability index, control of corruption, trade openness, government expenditure, government effectiveness, debt, capital formation, political stability and human capital were non-stationary at level but became stationary at first difference, hence integrated of order one, I(1).

4.4 Diagnostic Test Results

Several diagnostic tests were conducted so as to provide a justification for using SGMM. The diagnostics tests conducted included: multicollinearity test, serial correlation test, over identification and F-test for joint significance. Unlike the OLS model, SGMM does not assume normality and it permits heteroscedasticity. These excluded tests related to it since dynamic panel models are known for having common problem of allowing heteroscedasticity of data, which fortunately they can control (Baltagi, 2008).

4.4.1 Multicollinearity Test

A variance of inflation (VIF) was used to determine the degree of correlation between variables so as to avoid multicollinearity which can adversely affect the reliability of the study estimates. If there is high multicollinearity between independent variable, confidence intervals for coefficients will tend to be very wide and t-statistics will be very small.

Coefficients will have to be larger in order to be statistically significant; hence it will be harder to reject the null hypothesis when multicollinearity is present. A commonly

given rule of thumb is that VIFs of 10 or higher (or equivalently, tolerances of .10 or less) may be an indication of the problem of multicollinearity (Williams, 2015; Joseph, William, Black, Babin & Anderson, 2014). The results of mean VIF are given in Table 4.2.

Table 4.2: VIF Test

	CC	**CPI**	**MOI**
	Mean VIF	**Mean VIF**	**Mean VIF**
Determinants of corruption	3.89	3.99	3.90
Effect of corruption and government expenditure	3.07	3.47	3.11
Effect of corruption and corruption, economic growth	3.61	3.73	3.64

Source: Researcher (2019) Extracted from Tables A4.6, A4.7 & A4.8

VIF multicollinearity results for each variable presented in Tables A4.6, A4.7 and A4.8 of appendix II, show that there is no multicollinearity problem. This is because the correlation results show that all the variables had a variance inflation factor of less than 10 and a tolerance statistic greater than 0.10.

4.4.2 Serial Correlation Test Results

Serial correlation is usually a problem in long panels of 20 to 30 years as opposed with short panels (Torres, 2010). This study used a short panel data of 17 years, but to affirm the assertion by Torres (2010), the Arellano-Bond test serial correlation test was carried out. Since the null hypotheses are that there is no first-order AR(1) / second-order AR(2) serial correlation , it means that one needs to reject the null hypothesis in the AR(1) test but not to reject it in the AR(2) test to get appropriate diagnostics as shown in Table 4.3.

Table 4.3: Serial Correlation Results

		CC		CPI		MOI	
	Order	**Z**	**Prob>Z**	**Z**	**Prob>Z**	**Z**	**Prob>Z**
Determinants of corruption	AR(1)	-1.537	0.124	-1.636	0.101	-1.607	0.108
	AR(2)	-1.346	0.178	-1.091	0.274	-1.607	0.197
Effect of corruption on government expenditure	AR(1)	-1.094	0.274	-0.975	0.329	-1.408	0.159
	AR(2)	-1.880	0.060	-1.531	0.125	-1.877	-0.060
Effect of corruption on economic growth	AR(1)	-1.048	0.294	-1.961	0.049	-1.751	0.079
	AR(2)	-0.825	0.409	-1.603	0.108	-1.805	0.0709

Source: Researcher (2019)

Table 4.3 shows the serial correlation results. The Arellano-Bond test for zero autocorrelation in first-differenced errors (AR test) was used to test for the null hypothesis of no correlation. All the reported (AR2) statistics for the study models were within the acceptable range. With P values > 0.05, not rejecting the null hypothesis for the Arellano–Bond test statistics for second-order serial correlation in residuals indicating that there exists no autocorrelation in the errors for both dynamic system SGMM specifications suggestive that the instruments are orthogonal to the contemporaneous errors.

4.4.3 The F-Test of Joint Significance Results

The F-test (Wald test) of joint significance reports that we may reject the null hypothesis that independent variables are jointly equal to zero (p = 0.000) at any conventional level of significance. The results are presented in Table 4.4.

Table 4.4: Overall Significance Test Results

	CC		CPI		MOI	
	Wald2(4	Prob> chi2	Wald2(4	Prob> chi2	Wald2(4	Prob> chi2
Determinants of corruption	32.62	0.000	282.04	0.000	49.09	0.000
Effect of corruption on government expenditure	1028.91	0.000	141.05	0.000	226.10	0.000
Effect of corruption on economic growth	16.91	0.000	1801	0.000	195.98	0.000

Source: Researcher (2019)

Table 4.4 shows the Wald Chi-square test of joint significance reports which states that the null hypothesis of the independent variables is jointly equal to zero (p = 0.000) at 5 percent level of significance may be rejected by P values > 0.05. Table 4.4 show the models had p-values of less than 0.5 hence the null hypothesis was not rejected. The model was well specified.

4.4.4 Model Sargan Test Results

Table 4.5 shows the Sagan J-Statistics for over identifying restriction. The null hypothesis that the over identifying restrictions are valid and moment conditions are correctly specified cannot be rejected at 5 percent significance levels for the first step three dynamic system GMM models.

Table 4.5: Over Identification/Sargan Test Results

	CC		CPI		MOI	
	Chi sq	**Prob**	**Chi sq**	**Prob**	**Chi sq**	**Prob**
Determinants of corruption	19.3165	0.2526	12.5316	0.7066	15.6216	0.4070
Effect of corruption on government expenditure	16.7923	0.3992	20.3455	0.2051	17.6663	0.0604
Effect of corruption on economic growth	6.0681	0.9873	15.0309	0.6224	10.8574	0.8182

Source: Researcher (2019)

Sagan J-Statistics tests for over identification of the determinants of corruption as given in Table 4.5, confirmed that the specified variables are proper instruments with p-values of 0.2526, 0.7066 and 0.4070 for control of corruption, corruption perception and Mo Ibrahim indices respectively. The results confirmed that the second model was well specified as given by the p-values of 0.9873, 0.2051 and 0.0604 for the model for control of corruption, corruption perception respectively. The variables of control of corruption, corruption perception and Mo Ibrahim indices were all correctly specified as given by their p-values which were greater than 0.5. The results show that the exogenity of all SGMM instruments used are valid instruments.

4.5 Determinants of Corruption in EAC States

The first objective of this study was to analyse the determinants of corruption in the EAC states. To achieve this objective, the study employed SGMM which is applicable in situations where a variable can be affected by its previous levels as well as current and previous levels of other variables. Mo Ibrahim index of governance, corruption perception index, and world governance control of corruption indicators were used to

measure corruption. The results for the determinants of corruption are presented in Table 4.6.

Table 4.6: Results for the Determinants of Corruption

System dynamic-data estimation-One-step results

	Controlof corruption		**Corruption perception Index**		**Mo Ibrahim Index**	
	Robust					
	Coef	**Prob**	**Coef**	**Prob**	**Coef**	**Prob**
Corruption lag	-0.0744 (0.078)	0.339	0.5891*** (0.179)	0.001	0.6386*** (0.1109)	0.000
Economic growth	0.2441*** (0.076)	0.001	4.4451** (2.285)	0.050	-0.9113 (1.6313)	0.576
Rule of law	0.0008 (0.141)	0.995	-3.4687*** (0.624)	0.000	0.6795* (0.4140)	0.100
Government effectiveness	-0.3789*** (0.074)	0.000	-5.0176*** (1.323)	0.000	-2.2649*** (0.7266)	0.002
Capital formation	0.0062*** (0.002)	0.004	-0.1433*** (0.417)	0.001	0.0881*** (0.01290	0.000
Gini index	0.0260*** (0.006)	0.000	-0.0322 (0.159)	0.839	-0.0389 (0.443)	0.379
Economic stability (Inflation)	0.0075 (0.005)	0.117	0.1720 (0.117)	0.140	0.1548*** (0.0597)	0.010
Political stability	0.1311 (0.103)	0.203	8.1614*** (0.679)	0.000	1.1866*** (0.4759)	0.013
Human capital	0.3741 (2.674)	0.889	-7.7.418** (3.1969)	0.015	-2.0921*** (0.81788)	0.011
Cons	-1.1477 (0.176)	0.000	-1.6084 (6.6527)	0.809	-1.0608 (2.3230)	0.648
Mean VIF test	3.89		3.99		3.90	
Wald test	32.62	0.000	282.04	0.000	749.09	0.000
AR1	-1.5377	0.1241	-1.6369	0.1017	-1.6070	0.1080
AR2	-1.3469	0.1780	-1.0919	0.2749	-1.2893	0.1973
Sargan test	19.317	0.2526	12.532	0.7066	1715.622	0.4070
Number & instruments for differenced equation used.	2524 25 D2. Control of Corruption, D2Corruption perception Index, D2Mo Ibrahim Index, D2 Gross domestic product, D3.corruption indicator,D2.Human Capital, D.inflation, D2.capital formation,D2.Political, D. Rule of law, D2.Government effectiveness, D.Gini index					

***** Significant at 1 percent; ** 5percent; * 10percent;**
Source: Study Data (2019)

Table 4.6 SGMM results reveal that there is significant long run relationship between economic growth, government effectiveness, capital formation, Gini index, inflation, and control of corruption at 5 percent significance level. A percentage increase in

economic growth will increase the current control of corruption by 0.2441 index points. Since control of corruption is measured on a scale ranging between -2.5 to 2.5, where 2.5 is most performing in terms control of corruption index (perceived to be least corrupt) and -2.5 is least performing in terms control of corruption index (perceived to be most corrupt), positive relationship therefore, means an increase in economic growth will reduce corruption in EAC by 0.2441 index points at 5 percent significance level, holding other factors constant.

When corruption perception index is used, results reveal that there is statistically significant long run relationship between previous level of corruption perception index, domestic product, government effectiveness, capital formation, political stability, human capital and corruption perception index at 5 percent significance level. An index point increase in previous corruption perception index increases the current corruption perception index by 0.5891 index points. Since corruption perception index is measured on a scale of 1 to 100, where 1 is most corrupt state and 100 is least corrupt state, positive relationship means an increase in economic growth will reduce corruption in EAC by 4.4451 index points at 5 percent significance level holding other factors constant. This is in line with the findings of control of corruption, though different in size and magnitude.

On using Mo Ibrahim index to measure perception of corruption, the results show that there is significant long run relationship between Mo Ibrahim index and previous level of Mo Ibrahim index, government effectiveness, capital formation, inflation, political stability and human capital at 5 percent significance level. An index point increase in the previous Mo Ibrahim index increases the current Mo Ibrahim index by 0.6386 index points. If the countries are characterized by high level of corruption in

the past, chances are that they will be corrupt presently. Economic growth had a statistically insignificant coefficient of -0.9113 with p-value of 0.576. This was contrary to the findings when the control of corruption and corruption perception indices were used.

The three models establishing if economic growth is a determinant of corruption. The findings support Salih & Ali (2016) and Del Monte & Papagni (2007) studies. On the basis of this finding, it can be suggested that economic growth increases governments' strength in combating corruption, reduces the public perception regarding the existence of corruption, therefore, creates a reducing effect on corruption. Societies with high economic growth will reduce illegal activities. In this regard, a country with stable and high-rate growth will serve as a fundamental incentive of anti-corruption strategy in EAC countries.

In the long run, government effectiveness has a negative and significant coefficient at 5 percent significance level. An index point increase in government effectiveness will decrease control of corruption by -0.3789 index points other factors held constant. This means that, investment in the enforcement of making policies by government institutions will increase corruption levels substantially. The intuition behind this is two way, firstly, as the government institutions become more effective then more cases of corruption will be detected and dealt with. The other possible explanation is based on the premise that, although most developing countries have policies in place, nevertheless, cases of corruption keep on increasing despite government effectiveness in having such policies in place.

When corruption perception index is used, government effectiveness has a negative and significant coefficient at 5 percent significance level. An index point increase on

government effectiveness reduces corruption perception index by -5.0176 index points holding other factors constant. This means that investment in the enforcement of making policies by government institutions will increase corruption level. The intuition behind this is two way; as the government institutions become more effective then more cases of corruption will be detected. The other possible explanation is that most developing countries have policies in place but cases of corruption keep on increasing. This finding agrees with the findings of control of corruption.

An index point increase in government effectiveness reduces Mo Ibrahim index by -2.2649 index points holding other factors constant. This means that, investment in the enforcement of making policies by government institutions will increase corruption level. The intuition behind this is that most developing countries have policies in place but cases of corruption keep on increasing. This finding agrees with the findings of control of corruption index.

The Gini index had a positive and statistically significant relationship with control of corruption. The Gini index was established at 0.0260. A unit increase in Gini index increases control of corruption index by 0.026. This means that as Gini index increases control of corruption increases implying less corruption. A country where income is well distributed will mean a country will have less corruption cases. From the rule of thumb, as the Gini index approaches one (1), income is more equitably distributed in the economy hence less corruption and vice versa. The coefficient of Gini index was statistically insignificant when both corruption perception and Mo Ibrahim indices were used.

The result indicated that capital formation had a positive and significant coefficient at 5 percent significance level when control of corruption was used. A percentage

change in capital formation increases control of corruption by 0.0062 index points. On rescaling the control of corruption, it means a percentage increase in capital formation will reduce corruption by 0.0062. It means that a country with more investment it is likely to be less corrupt. Investments only increase when there is less corruption. Reduced corruption is an incentive to more investments hence more capital formation. The findings suggest that as investments increase in EAC states corruption declines.

Corruption perception index and capital formation had a negative and significant coefficient at 5 percent significance level. A one percentage change in capital formation increases control of corruption by -0.1433 index points. On rescaling the control of corruption, it means an index point increase in capital formation will increase corruption by 0.1433 index points. This finding contradicts the findings between control of corruption and capital formation which found a negative relationship.

A percentage change in capital formation increases Mo Ibrahim index by -0.0881 index points. On rescaling the Mo Ibrahim index, it means a percentage increase in capital formation will decrease Mo Ibrahim index by 0.0881 index points. This finding was in line with the findings of control of corruption, but contradicted the findings on corruption perception index. A country with more investment is less corrupt. The findings suggest that as investments increase in EAC states corruption declines.

In the long run, corruption perception index and rule of law had negative and statistically significant coefficients with corruption perception index. An index point increase in rule of law reduces the corruption perception index by -3.4687 index points; this means that as rule of law increases the country is perceived to be more

corrupt. This is possibly a realization that a country where rule of law is high, many cases of corruption will be detected and reported, hence perceived to be highly corrupt. This was contrary to the findings of other indicators of corruption findings, where rule of law was insignificant. It was also revealed that political stability was significant at 5 percent significance level with a positive coefficient of 8.161.

An index point increase in political stability index will increase corruption perception index by 8.161 index points. Positive corruption perception index means less corruption and this means if the country is more stable politically, corruption will decrease.

An index point increase in political stability index will increase corruption perception index by 1.1866 index points. This means if the country is more stable politically, corruption will decrease. This result pointed in the same direction in line with the other indicators of corruption but differed in magnitude and level of significance. The results are also in line with Lambsdorff (2005: 2003) findings which revealed that poor political system and policy distortions are the main causes of corruption. Collier (2000) and Collier and Gunning (1999) also argued that weak political systems and weak anti-corruption institutions promote corruption in economies. The findings of this study also support the findings of Nurudeen *et al.* (2014) on corruption and political instability.

The results indicated that an index point decrease in human capital will lead to 7.7418 index points increase in corruption perception index. This finding meant that as the citizens improve their education the incidences of corruption will also increase. This finding was in agreement with the results when Mo Ibrahim index was used to measure the same variable.

The findings revealed that a percentage decrease in human capital will lead to -2.09212 index points increase in Mo Ibrahim index. This finding is a true indication that as the citizen's education improves, the likelihood of more incidences of corruption is possible. This finding agrees with the results on corruption perception index, but differs with the findings on control of corruption index.

Inflation had positive and statistically significant coefficient of 0.1548 at 5 percent significance level. As inflation increases the Mo Ibrahim index increases. This means inflation has an inverse relation with the level of corruption. This is contrary to the findings when control of corruption and corruption perception indices are used.

4.6 The Effect of Corruption on Government Expenditure in EAC States

To achieve the second objective, the study analysed the effect of corruption on government expenditure in EAC states. One of the transmission channels of corruption that impact on economic growth is government spending. The growth of government expenditures in the EAC region justifies the understanding of how it is affected by corruption.

Three models were estimated so as to capture the effect of the three indicators of corruption on government spending. The results are presented in Table 4.7.

Table 4.7: Results for Effect of Corruption on Government Expenditure in EAC States

System dynamic-data estimation-One-step results						
	Government Expenditure model using CC		**Government Expenditure model using CPI**		**Government Expenditure model using corruption MOI**	
	Robust					
	Coef	**Prob**	**Coef**	**Prob**	**Coef**	**Prob**
Lagged government expenditure	0.1761** (0.742)	0.018	-0.0703** (0.0339)	0.039	-0.1505** (0.0753)	0.046
Corruption	-0.1467** (0.0651)	0.024	-0.0099*** (0.0034)	0.003	-0.0151* (0.0084)	0.074
Economic growth	0.8779*** (0.738)	0.000	0.9752*** (0.0927)	0.000	0.8750*** (0.0795)	0.000
Revenue	0.0099*** (0.0036)	0.006	0.0076*** (0.0027)	0.004	0.0087*** (0.0029)	0.004
Trade openness	0.0207*** (0.0059)	0.000	0.0167*** (0.0048)	0.001	0.0197*** (0.0069)	0.004
Debt	-0.0076 (0.0713)	0.916	0.0125 (0.0543)	0.818	-0.0059 (0.0658)	0.928
Capital formation	-0.0013 (0.0028)	0.651	-0.0029 (0.0030)	0.324	-0.0014 (0.0029)	0.668
Inflation	0.0043 (0.0027)	0.117	0.0018** (0.0009)	0.044	0.0053*** (0.0019)	0.007
Constant	-0.1308 (0.0933)	0.161	-0.1172* (0.0688)	0.089	-0.1165 (0.0746)	0.118
Mean VIF test	3.07		3.47		3.11	
Wald test	1028.91	0.000	141.05	0.000	226.10	0.000
AR1	-1.094	0.2740	-0.9757	0.3292	-1.4086	0.1590
AR2	-1.880	0.0601	-1.5315	0.1256	-1.8779	0.0604
Sargan test	16.7923	0.3992	20.3455	0.2051	17.6663	0.3438
Number and Instruments for differenced equation used.	24,24,24 D2. Control of Corruption,D2.Corruption perception Index,D2.Mo Ibrahim Index,D2.Government Expenditure, D3.Lagged government expenditure,D2.Revenue,D.Inflation,D2.Capital formation,D2.Trade, D2.debt					

***** Significant at 1 percent; ** 5 percent; * 10 percent;**
Source: Study Data (2019)

Table 4.7 shows the effect of Corruption on Government Expenditure using the three indicators of corruption. From the table the coefficient of the control of corruption index is negative and statistically significant. This means that as the country becomes

less corrupt (control of corruption increases) the government expenditure decreases. Specifically an index point increase in control of corruption (decrease in corruption) ranking will lead to 0.1467 percentage decrease in government expenditure. A high control of corruption means the country is less corrupt. The more corrupt country will spend more as opposed to a less corrupt country. These findings are in consistent with Hashem (2014) and Delavallade (2006) where corruption appears to modify the structure of public expenditure. R´eda and Cam´elia (2016) also found that corruption can positively affect growth in case of a low level of institutional development.

Corruption perception index coefficient was statistically significant at 5 percent level of significance. An index point increase in corruption perception index (decrease in corruption) will decrease government expenditure by 0.0099 units assuming that other factors remain unchanged. The negative coefficient reveals a positive effect of corruption on government expenditure. When the country is perceived as more corrupt, the government expenditure will increase. This finding contradicts Shonchoy (2010) who found that corruption has a negative influence on public expenditure in developing countries.

Table 4.7 further reveals that an index point increase in Mo Ibrahim index (decrease in corruption) will decrease government expenditure by 0.0151 holding other factors constant. The rationale behind a corruption-induced distortion of the public expenditures is that bribe-maximizing politicians prefer to allocate resources to areas with the best opportunities to be bribed which end up increasing government expenditure. These findings are in consistent with Mohamed (2013) which found that when a country is perceived as less corrupt, the government expenditure will decrease.

The finding affirms that corruption decreases the efficiency of government spending. By this inefficiency, it means more resource allocation goes towards different inefficient suppliers than those that would be the most efficient.

Table 4.7 further reveals that the current level of government expenditure depends on the previous government expenditure. The first estimation model reveals that there is significant relationship between control of corruption and lagged government expenditure. A percentage increase in lagged government expenditure increased the current expenditure growth by 0.1761 percent. Using corruption perception index and Mo Ibrahim index the relationship was negative. A one percentage increase in previous level of government expenditure decreases the current level of government expenditure by 0.0703 percent and 0.1505 percent respectively. This was contrary to the findings when control of corruption was used as a measure of corruption.

It can further be established from table 4.7 that the rate of economic growth positively affects the government expenditure. Specifically, in the first model of control of corruption, one percentage increase in economic growth will lead to 0.8779 percentage increase in the overall government expenditure. Introducing corruption perception index and Mo Ibrahim index, increase in economic growth by one percent will increase government expenditure by 0.9752 and 0.8750 percent respectively. As the economy grows, the government must expand her expenditure across all sectors, which increases the overall government expenditure. This findings support Devarajan, Swaroop & Zou (1996) which argued that as the economy grows the government will have many projects running which will increase the expenditure.

The three models results on the effect of revenue on government expenditure pointed the same direction. In the control of corruption model a one percent increase in

revenue will increase government expenditure by 0.0099 percent. In corruption perception index and Mo Ibrahim index models, increase in revenue by one percent will increase the level of government expenditure by 0.0099 and 0.0087 percent respectively. This means that, as the country increases its revenue more funds will be available to be spent by the government. When a country generates more revenue, her budget expands and more government projects may arise. The finding supports Mlambo (2005) who found that revenue promotes investment which increases government expenditure.

It can also be noted from table 4.7 that trade openness has a positive effect on government expenditure. For instance in the control of corruption model, one percent increase in trade openness increases government expenditure by 0.0207 percent. Using corruption perception index as a measure of corruption, one percent increase in trade openness increases government expenditure by 0.0167 percent. These results are inconsistent with d'Agostino, Dunne and Pieroni (2012) who found that as a country becomes more open, there will be more opportunities for investment which will end up increasing the government expenditure.

The results also revealed that as inflation increases the government expenditure increases. This can be explained by the fact that inflation makes things expensive thus spending more on government projects. From the findings it is clear that debt and capital formation do not statistically influence the government expenditure irrespective of which indicator is used to measure corruption.

4.7 The Effect of Corruption on Economic Growth in EAC States

The third objective of this study was to analyse the effect of corruption on economic growth in EAC states. The study estimated equation 3.20 presented in chapter three using system GMM. The results for the effect of corruption on economic growth in EAC states are presented in Table 4.8.

Table 4.8: Results for the effect of Corruption on Economic Growth in EAC States

System Dynamic-Data Estimation- One-Step Results						
	GDP using CC		**GDP using CPI**		**GDP using MOI**	
	Robust					
	Coef.	**Prob.**	**Coef.**	**Prob**	**Coef.**	**Prob.**
Lagged economic growth	0.2783*** (0.0910)	0.002	0.0656* (0.0389)	0.092	0.2166** (0.1097)	0.048
Corruption	0.2335** (0.0963)	0.015	0.0115*** (0.0024)	0.000	0.0092 (0.0069)	0.181
Government expenditure	0.9540*** (0.0549)	0.000	0.8257*** (0.1044)	0.000	0.8235*** (0.0789)	0.000
Revenue	-0.0101*** (0.0029)	0.001	-0.0039 (0.0029)	0.175	-0.0082** (0.0035)	0.019
Capital formation	0.0002 (0.0022)	0.917	0.0025 (0.0024)	0.296	0.0012 (0.0027)	0.649
Debt	-0.0314 (0.0503)	0.532	-0.0515* (0.0303)	0.090	-0.0385 (0.0421)	0.361
Trade openness	-0.0189*** (0.0056)	0.001	-0.0514* (0.0303)	0.090	-0.0163** (0.0077)	0.035
Cons	0.1469 (0.0775)	0.058	0.0836 (0.0546)	0.126	0.1288 (0.784)	0.0101
Mean VIF test	3.61		3.73		3.64	
Wald2(4 test	16.91	0.0020	1801.25	0.000	195.98	0.000
AR1	-1.0482	-1.0482	-1.9616	0.0498	-1.7516	0.0798
AR2	-0.8252	0.4093	--1.0635	0.1088	-1.8058	0.0709
Sargan test Chi2	6.0681	0.9873	15.0309	0.6224	10.8574	0.8182
Number & Instruments differenced equation	27,27,27 D2.Control of Corruption, D2.Corruption perception Index, D2.Mo Ibrahim Index, D2 Economic growth, D3.Lagged Economic growth, D2.Capital formation, D2.Trade, D2.Government spending, D2.Debt					

***** Significant at 1 percent; ** 5percent; * 10percent**

Source: Study data (2019)

Table 4.8 reveals the effect of corruption on economic growth using the three indicators of corruption. The coefficient of the control of corruption was positive and statistically significant at 5 percent level of significance. An index point increase on control of corruption ranking (decrease in corruption) will increase the economic growth by 0.2535 percent holding other factors constant. This means that a less corrupt country will experience high rate of economic growth as opposed to a more corrupt country. The negative effect of corruption on economic growth support (Mauro, 2002). Mauro (2002) established that corruption reduces the incentive to invest and thus affecting economic growth negatively. Further using control of corruption, Nadia, Galli & Ilaria (2012) and Mauro's (1995) supported the hypothesis that corruption has negative impact on growth in the transitional economies

It is also noted that an index point increase on corruption perception index (decrease in corruption) will increase the rate of economic growth by 0.0115 percent. This positive relationship between corruption perception index and economic growth therefore means the less corrupt country will experience high rate of economic growth as opposed to more corrupt countries. These findings are consistent with Egunjobi, (2013) which found that corruption slows down the rate of economic growth. Using corruption perception index, Kamiru, Sissoko, and McGowan (2013) further established the negative effect of corruption on economic growth.

Further table 4.8 reveals that an index point increase in Mo Ibrahim Index (decrease in corruption) will increase the economic growth by 0.0092 percent holding other factors constant. The positive relationship between Mo Ibrahim Index and economic growth therefore means the less corrupt country will experience high rate of economic

growth as opposed to more corrupt countries. The Mo Ibrahim Index finding supports Mohamed (2013) which showed that corruption affected economic growth negatively via other variables of channels. Ceyhun (2016) also using Mo Ibrahim Index established a negative relationship between corruption and economic growth.

From the three estimation models, it can be noted that corruption is bad for economic growth. The negative effect of corruption on economic growth and positive effect of corruption on government expenditure brings out the narrative of the indirect effect of corruption on growth and inefficiencies resulting from corrupt practices on government expenditure which does not find its way to economic growth. Regardless of the indicator of corruption, the findings reveal that corruption affects growth negatively, but increases the government expenditure. It is also established that government expenditure increases economic growth. By intuition, it reveals the existence of inefficiency in the nexus between corruption and government expenditure.

These negative coefficients of corruption present transmission mechanisms of unfavorable effects of corruption on economic growth. This study therefore supports the findings of Muhammad, Sallahuddin and Khairuzzaman (2013) who argued that corruption reduces economic performance due to rent seeking, an increase of transaction costs and uncertainty, inefficient investments, and misallocation of production factors. Since corruption increases government expenditure but reduces economic growth, then this suggests that corruption affects government expenditure efficiency and that is why the increase is not translated to economic growth.

This finding also supports the first school of thought which argues that corruption has negative effects (sands the wheels) on economic growth and development (Mauro,

1995). The findings of this study are in conformity with the work of Ackerman (2006), Ryvkin and Serra (2012) and Seka (2013). However, the findings of this study contradict the second school of thought pioneered by Bardhan (1997) and Leff (2002), who argue that corruption can grease the wheels of growth in the presence of weak regulatory frameworks, government inefficiency and result to increase in economic growth.

From Table 4.8, it can be noted that government expenditure had a positive effect on the rate of economic growth irrespective of the corruption indicator used. For instance, in the control of corruption model one percentage increase in government spending increases economic growth by 0.9540 percent. Introducing corruption perception index and Mo Ibrahim index into the model, a unit increase in the government expenditure will increase the rate of economic growth by 0.8257 and 0.8235 units respectively. These findings were consistent with the findings of Tanzi and Davoodi, (1997, 1998) who found that an increase in the share of public investment (public spending) leads to increase in GDP. An inclusion of corruption leads to a reduction in the average efficiency or productivity of that investment reducing the economic growth rate.

These findings further support the Keynesian model which presents government expenditure as one of the components of economic growth. Increased government spending is likely to cause a rise in aggregate demand (AD). This can lead to higher growth in the short-term. Higher government spending will also have an impact on the supply side of the economy depending on which area of government spending is increased.

The results presented in Table 4.8 reveal that there is significant relationship between economic growth and previous level of economic growth at 5 percent level of significance. The coefficients of the lagged economic growth were positive and statistically significant at 5 percent level of significance in two models. One percent increase on previous year rate of economic growth will increase the current rate of economic growth by 0.2783 and 0.2166 percent in control of corruption and Mo Ibrahim Index models respectively.

Further, the study found that more revenue collection can lead to less economic growth. For instance, in the control of corruption model one percent increase in revenue will decrease the rate of economic growth by 0.0101 percent. Introducing Mo Ibrahim Index into the model similar results are also obtained. A percentage increase in the revenue rate will decrease the rate of economic growth by 0.0082 percent. These findings support Omoteso and Hakeem (2015) which argued that high revenue which signals high rates of taxation will de-motivate investors thus decreases the rate of economic growth.

The reason behind the negative relationship between economic growth and revenue can be explained by the fact that, high revenue collection means that people are taxed highly. High tax rate can de-motivate investors due to the feeling that all their profits will be taxed away. This will lower the level of both foreign investment and domestic investment thus affecting the economic growth negatively-this effect is known as the crowding out effect.

The finding also reveals that the coefficient of trade openness was a negative and statistically significant at 5 percent level of significance. A percentage increase in trade openness will decrease the rate of economic growth by 0.0189 and 0.0163

percent in control of corruption and Mo Ibrahim Index respectively. In the corruption perception index, the coefficient of trade openness becomes statistically significant at 10 per cent.

Lastly, Table 4.8 reveals that a percent increase in debt will decrease economic growth by 0.0515 percent when corruption perception index was used. This supports the debt overhang theory which argues that too much debt will decrease investment due to a feeling that the returns from investment will be taxed a way to pay high interest rate of existing debt. Decrease in investment will decrease the economic growth as put forward by the Keynesian model.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Introduction

This chapter presents a summary of the study, conclusions and the suggested policy implications of the findings, contribution to knowledge and areas for further research.

5.2 Summary of the Findings

The pursuit of sustainable economic development for EAC states in the midst of corruption has become a fundamental challenge. From the available statistics, the region has over time been characterised by high levels of corruption coupled with increased government expenditure and the individual countries in the EAC region have failed to attain and sustain an average of 7 per capita economic growth rate to fast track the set SDGs and African agenda 2063.

Similarly, there are limited studies in the region showing the direct and indirect effect of corruption on growth thereby leaving a lacuna or inconclusive debate in the understanding of corruption, government expenditure and economic growth. This study endeavoured to empirically establish the determinants of corruption and its effect on public expenditure and economic growth using a number of key corruption indicators to extend the analysis by testing the robustness of alternative measure of corruption.

The main objective of this study was to establish the nexus between corruption, government expenditure and economic growth in EAC states. The specific objectives

of the study were: establish the determinants of corruption in EAC states; analyse the effect of corruption on government expenditure and economic growth in EAC states.

The study used a balanced panel data set of 17 years (2000-2017) to explain the relationship between corruption, government expenditure and economic growth in the EAC states. The study estimated several simultaneous equations to establish the relationship between corruption, government expenditure and economic growth in EAC states using system generalized method of Moments estimation technique.

The study utilized data from World Bank development indicators, IMF publications, data for corruption indicators; Mo Ibrahim index from Africa governance indicators, corruption perception index from transparency international publications, control of corruption index from world governance indicators.

To establish the determinants of corruption in EAC states, results reveal a significant long run relationship between domestic product or economic growth and government effectiveness, capital formation, Gini index, inflation and control of corruption at 5 percent significance level. When using control of corruption, the study established that an increase in economic growth will reduce corruption in EAC by 0.2441 index points at 5 percent significance level, holding other factors constant.

When corruption perception index was used, results revealed that there was significant long run relationship between previous level of corruption perception index, domestic product, government effectiveness, capital formation, political stability, human capital and corruption perception index at 5 percent significance level. An increase in economic growth will reduce corruption in EAC by 4.4451 index

points at 5 percent significance level, holding other factors constant. This is in line with the findings on control of corruption, though different in size and magnitude.

When Mo Ibrahim index was used to measure corruption, results showed that there was significant long run relationship between the current Mo Ibrahim index and previous level of Mo Ibrahim index, government effectiveness, capital formation, inflation, political stability and human capital at 5 percent level.

To achieve the second objective, the study analysed the effect of corruption on government expenditure in EAC states. Three models were estimated so as to capture the effect of the three indicators of corruption on government spending. The study established that a statistically significant relationship between control of corruption and government expenditure at 5 percent level of significance when control of corruption was used. An index point increase in control of corruption will lead to 0.1467 percentage increase in government expenditure. The more corrupt country will spend more as opposed to less corrupt countries.

When corruption perception index used the findings revealed that there was a statistically significant relationship between government expenditure and corruption perception index at 5 percent level of significance. An index point increase in corruption perception index will increase government expenditure by 0.0099 percent assuming that other factors remain unchanged.

The findings revealed that there is a statistically significant relationship between government expenditure and previous level of government expenditure at 5 percent level of significance when the Mo Ibrahim index was used. A percentage increase in

previous level of government expenditure increases the current level of government expenditure by -0.1505 percent.

When control of corruption index was used, the results revealed that the coefficients of economic growth, revenue, trade openness were statistically significant at 5 percent level of significance.

The control of corruption results also reveals that a percentage increase in revenue will increase the government expenditure by 0.0099 percent. On the other hand, trade openness had a positive statistically significant effect on government expenditure. The result also reveals that a percentage increase in revenue will increase government expenditure in all the three models. The study also established a positive relationship between trade openness and government expenditure for the three models analyzed.

The third objective of this study was to analyse the effect of corruption on economic growth in EAC states. The three models estimated the effect of corruption on economic growth using control of corruption, corruption perception index and Mo Ibrahim index as an indicator of corruption. The results revealed that there was a significant relationship between economic growth and previous level of economic growth at 5 percent level of significance.

The results indicated that there was a negative relationship between control of corruption, corruption perception index and Mo Ibrahim index and economic growth. This means the less corrupt country will experience high rate of economic growth as opposed to high corrupt countries. The study established that when control of corruption, corruption perception index and Mo Ibrahim index were used, a

percentage increase in government spending increases economic growth by 0.9540, 0.8257 and 0.8235 percent respectively.

On the other hand, the study established that revenue decreases economic growth for the three models. A percentage increase in the revenue rate will decrease the rate of economic growth by 0.0082, 0.0101 and 0.0082 percent in the models using control of corruption, corruption perception index and Mo Ibrahim index respectively. High revenue which signals high rates of taxation will de-motivate investors thus decreases the rate economic growth.

The study established a negative effect of corruption on economic growth and positive effect of corruption on expenditure. This brings out the narrative of the indirect effect and cost in terms of economic distortions, inefficiencies and waste resulting from corrupt practices on government expenditure, which does not find its way to economic growth. Regardless of the indicator of corruption, the findings reveal that corruption affects growth negatively, but increases the government expenditure. It is also established that government expenditure increases economic growth-by intuition, it reveals the existence of inefficiency in the nexus between corruption and government expenditure.

5.3 Conclusions

This work augments the understanding of the determinants of corruption in EAC states and suggests a number of ways to reduce corruption by identifying its true determinants. By using different corruption indicators, the study found that real GDP per capita is the important determinants of corruption. The findings also suggest some variables which determine the level of corruption. These variables include;

government effectiveness, rule of law and human capital. However, irrespective of the indicator of corruption used, it was established that corruption reduced economic growth.

This paper provides evidence that corruption plays a critical and significant role in determining the level of government expenditure in the EAC states. It addresses the complex way or channel through which corruption affects economic growth through government expenditure.

The results further, show that corruption affects growth through government expenditure, hence justifying the existence of direct and indirect effect of corruption on economic growth. The present study also conforms to previous findings and contributes additional evidence that suggest that corruption in societies is undoubtedly very complex and involves different economic, political and social sectors that were incorporated in the system dynamics model of corruption. One of the significant findings emerging from this study is that the simulation results show that an increase in level of GDP in the short-run and in the long-run explain the level of corruption in EAC member states.

The results suggest that corruption in EAC countries affects government expenditure and economic growth positively and negatively respectively. The positive coefficient of GDP and government expenditure affirms the existence of bidirectional causal effect of the two variables. The positive coefficient of corruption and government expenditure suggest the existence of increasing expenditures as a result of corruption. While a negative coefficient between corruption indicators and economic growth suggest the presence of inefficiency in those expenditures which do not translate to economic growth.

This affirms the fact that corruption augments government expenditure, but reduces its effect on economic growth, and therefore, one of the mechanisms through which corruption affects growth. If corruption increases government expenditure and government expenditure increases economic growth, then by transitivity corruption should increase economic growth, which is not the case. This brings out the direct and indirect effect of corruption, where the direct effect is the distortions on economic growth, while the indirect is the inefficiency caused on government expenditure. Therefore, corruption affects economic growth negatively by increasing inefficiencies in the government expenditure.

5.4 Policy Implications

The findings of this study have some policy implications to various EAC states governments in combating corruption, promoting government expenditure efficiency and promoting sustainable economic growth through various government interventions.

East Africa Community State governments should endeavour to promote institutional reforms that inform government effectiveness, strengthen the rule of law and enhance accountability. This is because the results show that government effectiveness is a key determinant of corruption. In order to ensure government effectiveness, the policy makers in these governments should take practical steps in reforming the entire justice systems in the individual countries (courts, police, prisons, anticorruption agencies and human rights organizations).The policy makers should endeavor in reducing public sector inefficiencies, minimize economic interventions that are restrictive on economic growth such as taxes, regulations, licenses, controls, quantitative restrictions so as to reduce corruption in the public sector. These restrictive policies

should be replaced with economic policies that are liberal and which enhance competition. By doing so, bureaucracy in the public sector will be reduced thus reducing corruption.

On the other hand, when considering achieving envisaged or required economic growth, governments should address the issues of public expenditure inefficiency and by extension work on policies that promote prudent government expenditure. Empirical results show that, corruption causes government expenditure to increase, but it has a negative effect on economic growth. This suggest the existence of inefficiency on the side of government expenditure. Government expenditure efficiency will be enhanced through the reforms of the state institutions. This involves reforming public sector operations, reforming the budgeting systems, financial management and the tax sectors and strengthening of the entire justice systems.

High corruption levels prevailing in EAC countries represent the symptom of systemic underlying fundamental economic, political and institutional causes. For any effective remedy, addressing the relevant underlying issues is necessary. From empirical results, economic growth is one of the determinants of corruption. Further, there is a bidirectional inverse relationship between economic growth and corruption. EAC states governments should put in place preventive measures such as establishment of stable and high-rate of economic growth through prudent reforming of the economic policies, institutions, and incentives necessary to spur growth as a way of reducing corruption. Fighting corruption from the economic point of view requires examination from a supply and demand perspective. It requires economic policies (fiscal or monetary) that promote equity. Corruption is a symptom of inequality in the economic system.

Based on the literature review of this study on corruption and the complexities of measuring it, there is urgent need of individual countries emphasizing on real time data on expenditures from relevant state departments such as control of budget and the auditor general. This data can form the basis of tracing backwards where corruption incidences begun. This study utilized the perception-based data for analysis because of the unavailability of such data in the public domain. Best data to measure corruption is hard get unless these institutions in the individual countries work effectively. The practice of conduct of secrecy regarding some critical data by state functionaries has aided corrupt individuals in the public sector to continue with corruption.

Economic interventions that are restrictive upon economic openness such as taxes, tariff controls, licenses and quantitative restrictions should be implemented sparingly. Expansionary economic policies which promote competition and freedoms should be encouraged. The empirical results show that there is a negative relationship between economic openness and economic growth, but positive relationship between economic openness and government expenditure in the region, suggesting contradiction to theory. Application of strict and restrictive regulations on trade openness increase corruption and impact negatively on economic growth. Policy makers in East Africa should reduce the inter-country trade restrictions for the benefit of trade openness to translate to economic growth.

The East African Community states should endeavour to establish an independent agency to monitor and track government expenditures in the region. The empirical results suggest government expenditure as a major channel through which corruption affects growth in the region. This agency should give periodical reports on

government expenditures to key government institutions such as the anticorruption agency. This will ensure prudent use of public resources. In addition, while potential policy implication might be that it would be desirable to encourage governments to improve the quantity of government expenditure, it is important to determine whether the increase can be specified and monitored to deter corrupt officials from substituting productive public projects within the various expenditure categories with unproductive ones.

Based on the empirical literature on the study of corruption and other macroeconomic variables, it is noted that corruption is a multi-faceted phenomenon. For better understanding of effects of corruption on economic growth, it should be looked at by EAC governments as a regional as well as national challenge. There should be specific national and regional policies in curbing corruption from both the supply and demand side.

5.5 Contributions to Knowledge

Most studies linking corruption, government expenditure and economic growth have not shown cogently the direct and indirect effect of corruption on growth. This study clearly showed how public sector is affected by corruption, which further affects growth in the region. This was achieved through structural simultaneous equations, unlike other studies that only show the direct link between economic growth and corruption.

Many available studies have concentrated on examining the effects of corruption on growth with the main focus being on regional blocs in developed nations. These studies have been conducted in developed countries and in some Sub-Saharan Africa

countries with little focus on the EAC region. This study is key in understanding of the nexus between corruption, government expenditure and economic growth in EAC. The study can be used as a genesis in understanding how to address some economic challenges caused by corruption on the road to entrenching regional integration.

Some of the studies on corruption and growth have a bias on one measurement indicator for corruption. This is a comprehensive study using three key corruption indicators supported by empirical literature on the East Africa Community region. The use of three corruption indicators extends the analysis of understanding the link between corruption, government expenditure and economic growth by testing the robustness of alternative measure of corruption. This is imperative in the region with a view to proposing appropriate policy choices in the wake of various governance reforms as well as increased advocacy for regional integration.

This study employed SGMM method of estimation technique which is robust to all sources of potential endogeneity. The estimation was motivated by use of system of equations composed of a difference equation and a level equation to establish the direct and indirect effects of corruption on economic growth in the East Africa Community states. The dynamic system GMM was based on Arellano and Bover (1995) and Blundell and Bond (1998) which developed a system of simultaneous difference and level equations within the GMM framework yield more efficient, consistent and asymptotically more efficient estimators than the dynamic difference GMM developed by Arellano and Bond (1991).

5.6 Areas of Further Research

This study sought to establish the effects of corruption of government expenditure and economic growth in East Africa Community states. Further research remains crucial to improving the understanding of the interaction between corruption, government expenditure and economic growth.

It may be interesting to show how corruption would affect other channels apart from government expenditure and economic growth in individual countries with different institutional frameworks or at different stages of economic development.

In this respect, the deeper understanding of micro and macroeconomic costs of corruption, this thesis is broad in terms of scope. There is need for a study and further research that will focus more intently on individual countries and sectors by using alternative estimations techniques and conceptualizations.

There is also need to collect better quantitative data on different types of corruption and use it for analysis. Reliable data can be sourced from the Controller of Budget and Auditor General or the proxy institutions. The quality of the data used on corruption CPI and CC is perception based, so it may not report optimally on the effects of corruption on economic variables under study in the EAC. There should a more focused data collection and measurement for corruption to improve quality in terms of validity and reliability.

There is urgent priority for further research on measures and practical steps individual governments may take to strengthen institutions that deal with control of corruption, generating effectiveness in government, rule of law, democracy, political stability, and economic policies in EAC.

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APPENDICES

Appendix 1: Data

Table A4.1 Dataset

ID	COUNTRY	YEAR	CORRCC	CAPF	INF	CORRMOI	CORRCPI	GDP	HUMANC	GOVTEXP	TRADE	POLITICS	RULE	GNI	REVENU	DEBT	GEFF
BUR	1	2001	-1.080	15.469	16.696	29.400	20.000	1.723	0.187	25.024	15.421	-2.290	-1.520	38.000	17.446	131.906	-1.387
BUR	1	2003	-0.975	16.052	3.305	30.200	22.500	2.009	0.193	24.736	21.721	-2.275	-1.470	37.750	20.209	165.529	-1.398
BUR	1	2005	-0.995	16.464	4.658	30.600	25.000	2.411	0.207	30.269	30.362	-2.355	-1.460	37.450	23.966	154.859	-1.279
BUR	1	2007	-1.010	17.012	9.376	29.750	22.500	3.118	0.221	38.636	35.854	-2.415	-1.570	37.150	31.503	129.934	-1.186
BUR	1	2009	-0.935	16.764	10.715	29.150	25.000	4.068	0.234	36.973	31.685	-2.015	-1.395	36.850	35.651	64.103	-1.087

BUR	1	2011	-0.985	15.758	7.999	27.450	27.500	4.892	0.260	34.808	22.138	-1.450	-1.085	36.550	37.952	44.809	-1.082
BUR	1	2013	-1.095	14.252	5.578	24.800	22.500	4.433	0.291	37.720	16.626	-1.355	-1.035	36.450	32.551	38.769	-1.193
BUR	1	2015	-1.070	12.207	16.410	24.550	20.000	4.157	0.312	40.064	13.039	-1.475	-1.065	36.550	25.005	40.518	-1.144
BUR	1	2017	-1.045	12.692	17.482	24.950	20.000	4.338	0.341	39.576	12.234	-1.445	-1.100	36.600	14.496	50.066	-1.378
KEN	2	2001	-0.985	18.729	6.797	42.300	21.000	2.163	0.412	19.186	14.373	-1.050	-1.015	45.150	18.528	54.224	-0.580
KEN	2	2003	-0.970	17.920	3.990	42.300	20.000	2.230	0.414	20.417	14.309	-1.195	-0.905	45.100	18.986	60.989	-0.627
KEN	2	2005	-0.910	16.658	4.070	42.300	21.500	1.715	0.423	21.119	13.172	-1.265	-0.900	45.050	20.083	51.069	-0.647

KEN	2	2007	-0.815	17.198	7.182	42.600	24.000	3.792	0.443	20.637	14.206	-1.175	-0.875	44.950	19.503	41.174	-0.558
KEN	2	2009	-0.890	17.866	8.102	43.200	28.000	5.150	0.453	20.808	15.909	-1.165	-0.880	44.900	19.121	41.282	-0.610
KEN	2	2011	-0.925	18.425	6.932	43.300	30.000	5.760	0.466	21.409	15.564	-1.185	-0.890	44.800	19.628	43.726	-0.562
KEN	2	2013	-0.890	19.546	5.153	43.450	30.000	6.353	0.476	21.733	14.709	-1.190	-0.925	44.600	19.422	43.920	-0.490
KEN	2	2015	-0.965	20.035	9.683	43.350	30.000	3.542	0.480	22.461	14.467	-1.325	-0.995	44.400	19.433	50.004	-0.314
KEN	2	2017	-1.045	19.473	12.827	41.500	30.000	1.770	0.489	22.980	13.616	-1.410	-1.045	44.250	18.497	53.710	-0.314
RWA	3	2001	-0.715	13.531	3.634	52.100	32.500	8.430	0.279	22.063	30.595	-1.980	-1.445	45.800	20.875	100.578	-0.658

RWA	3	2003	-0.555	13.649	2.670	52.100	30.000	10.84	0.289	23.188	30.417	-1.795	-1.140	46.150	20.811	100.036	-0.802
RWA	3	2005	-0.530	13.724	4.713	52.100	30.000	7.694	0.306	22.709	30.098	-1.470	-0.905	46.500	23.439	79.542	-0.732
RWA	3	2007	-0.540	14.453	9.713	52.250	30.000	4.831	0.327	20.879	32.592	-1.165	-0.845	46.900	21.918	23.604	-0.225
RWA	3	2009	-0.610	15.386	10.551	52.300	30.000	8.418	0.346	21.506	34.847	-1.070	-0.865	47.250	24.315	19.501	-0.141
RWA	3	2011	-0.455	16.278	8.977	51.850	30.000	9.303	0.368	22.177	36.378	-0.830	-0.790	47.400	24.935	19.907	0.008
RWA	3	2013	-0.080	17.836	8.956	52.300	32.500	8.423	0.388	22.761	39.279	-0.505	-0.615	47.450	24.375	23.356	-0.014
RWA	3	2015	0.075	21.423	12.261	55.150	35.000	9.390	0.395	23.891	41.669	-0.310	-0.520	47.500	24.439	31.243	-0.036

RWA	3	2017	0.140	23.661	12.894	57.250	35.000	8.710	0.405	23.739	41.884	-0.385	-0.485	47.500	23.162	38.872	0.177
TAN	4	2001	-0.960	13.499	5.552	36.000	23.500	5.466	0.319	12.259	26.001	-0.645	-0.340	42.750	17.455	47.620	-0.409
TAN	4	2003	-0.945	13.201	4.851	36.000	24.500	6.449	0.328	12.880	27.755	-0.570	-0.390	42.900	12.315	45.675	-0.399
TAN	4	2005	-0.860	14.580	4.492	36.000	26.000	6.629	0.338	14.428	28.964	-0.600	-0.340	43.100	14.093	45.679	-0.436
TAN	4	2007	-0.680	17.457	4.284	37.250	26.500	6.785	0.349	16.198	32.018	-0.750	-0.325	43.300	14.847	27.220	-0.391
TAN	4	2009	-0.615	20.209	4.249	38.300	31.500	6.833	0.362	17.816	35.279	-0.605	-0.310	43.500	16.597	22.937	-0.546
TAN	4	2011	-0.435	23.756	5.805	40.350	35.000	5.558	0.375	18.225	39.864	-0.445	-0.350	43.750	15.584	27.593	-0.625

TAN	4	2013	-0.280	29.445	7.140	41.750	35.000	6.563	0.385	17.988	45.413	-0.335	-0.400	44.000	15.624	30.026	-0.701
TAN	4	2015	-0.380	32.463	8.652	39.700	32.500	7.016	0.395	18.303	48.542	-0.275	-0.355	44.100	15.179	35.518	-0.633
TAN	4	2017	-0.430	28.601	11.210	38.400	30.000	5.475	0.405	19.336	46.280	-0.070	-0.430	44.100	15.003	37.469	-0.591
UGA	5	2001	-0.885	31.421	2.652	38.900	20.500	6.353	0.435	20.393	11.386	-1.290	-0.715	40.900	19.374	64.808	-0.416
UGA	5	2003	-0.895	31.260	0.811	38.900	19.500	7.911	0.449	21.388	11.890	-1.420	-0.720	41.300	19.581	71.265	-0.409
UGA	5	2005	-0.870	30.849	4.205	38.900	19.000	6.608	0.461	21.552	11.003	-1.545	-0.595	41.500	19.616	59.379	-0.474
UGA	5	2007	-0.775	30.305	6.188	39.300	20.000	5.981	0.453	20.794	10.525	-1.450	-0.590	41.500	16.527	29.021	-0.487

UGA	5	2009	-0.800	10.230	6.134	38.450	25.500	7.905	0.444	19.504	11.747	-1.365	-0.600	41.500	13.687	19.753	-0.604
UGA	5	2011	-0.800	10.220	7.911	37.350	30.000	8.528	0.449	18.273	12.926	-1.335	-0.455	41.500	13.834	22.908	-0.520
UGA	5	2013	-0.775	29.770	6.655	37.700	30.000	7.557	0.457	17.469	13.301	-1.140	-0.375	41.500	14.145	32.141	-0.494
UGA	5	2015	-0.810	29.874	9.067	38.200	30.000	9.246	0.467	16.983	14.008	-1.005	-0.395	41.500	14.145	32.141	-0.494
UGA	5	2017	-0.865	27.616	12.531	37.400	28.000	9.249	0.475	16.026	13.997	-1.035	-0.410	41.500	15.006	38.733	-0.579

Source: Word Bank Development Indicators

CC: Control of Corruption, CPI: Corruption perception Index, MOI: Mo Ibrahim Index, GDP: Gross domestic product, HC: Human Capital, INF: Rate of inflation, CF: Capital formation, PS: Political stability, RL: Rule of law, Trade: Trade openness, GE: Government spending, GNI &DEBT:

Appendix 2: Summary of Country Specific Descriptive

Table A4.1: Summary of Country Specific Descriptive

Variable	Kenya			Tanzania			Rwanda			Uganda			Burundi			
	Mean/ Ʊ	Max	Min	Mean/ Ʊ	Max	Min	Mean/ Ʊ	Max	Min	Mean/ Ʊ	Max	Min	Mean/ Ʊ	Max	Min	Obs
Economic growth	3.78 (2.19)	7.40	1.28	3.01 (1.48)	5.15	1.35	8.44 (2.77)	10.84	4.83	1.60 (8.38)	6.02	2.72	1.8 (8.66)	8.05	3.07	9
Government expenditure	8.21 (5.13)	1.70	2.46	5.23 (3.12)	9.97	1.65	1.14 (6.62)	2.09	3.93	2.93 (1.29)	4.62	2.72	6.54 (3.84)	1.99	1.21	9
Control of corruption	-.93 (0.07)	-.82	-1.0	-.62 (0.26)	-.28	-.96	-.36 (0.32)	0.14	-0.72	-.83 (0.048)	-.895	-.775	-1.02 (0.05)	-1.095	-9.35	9
Corruption perception index	26.06 (4.38)	30	20	29.39 (4.41)	35	23.5	31.67 (2.17)	35	30	24.72 (4.94)	19	30	27.87 (2.49)	20	27.5	9
Mo Ibrahim	42.7 (0.66)	43.45	41.5	38.19 (2.09)	41.8	36	53.04 (1.87)	57.25	51.85	38.34 (0.72)	37.35	39.3	27.87 (2.49)	24.55	30.6	9
Rule of law	-.94 (0.06)	-.88	-1.0	-.36 (0.04)	-.31	-.43	-0.85 (0.30)	-.49	-1.45	-.54 (0.13)	-.72	-.375	-1.3 (0.22)	-1.57	-1.035	9
Government effectiveness	-.52 (0.13)	-.31	-.65	-.53 (0.12)	-.39	-.70	-.27 (0.36)	0.18	-0.80	-.50 (0.06)	-.60	-.41	1.24 (0.12)	-1.40	-1.08	9
Revenue	19.24 (0.52)	20.08	18.50	15.19 (1.46)	17.45	12.31	23.14 (1.58)	24.94	20.81	16.21 (2.62)	13.69	19.62	26.53 (8.30)	14.50	37.95	9
Debt	1.99 (6.02)	3.22	1.47	1.13 (3.97)	1.91	7.14	2.38 (1.07)	3.80	1.09	7.21 (2.39)	1.14	3.88	1.60 (7.23)	9.16	2.61	9
Trade	14.48	15.90	13.1	36.68	48.54	26.0	35.31	41.88	30.10	12.31	10.52	14.0	22.12	12.23	35.85	9

openness	(0.85)		7	(8.63)		0	(4.76)			(1.29)		0	(8.69)			
Gini Index	44.8 (0.32)	45.15	44.25	43.5 (0.52)	44.1	42.75	46.94 (0.64)	47.5	45.8	41.41 (0.20)	40.9	41.5	37.04 (0.58)	36.45	38	9
Inflation	7.19 (2.81)	12.83	3.99	6.25 (2.37)	11.21	4.25	8.26 (3.73)	12.89	2.67	6.24 (3.48)	0.81	12.53	10.25 (5.47)	3.30	17.48	9
Capital formation	18.43 (1.13)	20.04	16.66	21.47 (7.40)	32.46	13.20	16.66 (3.66)	23.66	13.53	250.67 (437.58)	27.62	1023	15.19 (1.75)	12.207	17.01	9
Human Capital	0.45 (0.029)	0.48	0.41	.36 (0.03)	.41	0.32	0.34 (0.05)	0.41	0.28	.45 (0.01)	.4345	.475	.25 (0.55)	.1865	.341	9
Politics	-1.22 (0.10)	-1.41	-1.05	-.48 (0.22)	-.07	-.75	-1.1 (0.61)	-0.31	-1.98	-1.29 (0.19)	-1.545	-1.005	-1.90 (0.46)	-2.42	-1.36	9

Appendix 3: Measurement of Corruption Indicators

The Ibrahim Index of African Governance (IIAG) is a tool that measures and monitors governance performance in African countries. The Mo Ibrahim Foundation defines governance as the provision of the political, social and economic public goods and services that every citizen has the right to expect from their state, and that a state has the responsibility to deliver to its citizens. In the IIAG, country performance in delivering governance is measured across four key components that effectively provide indicators of a country's Overall Governance performance.

The key components that form the four categories of the IIAG as described in the diagram below are **Safety & Rule of Law, Participation & Human Rights, Sustainable Economic Opportunity and Human Development**. Each of these categories contains subcategories under which we have organized various indicators that provide quantifiable measures of the overarching dimensions of governance. In total, the IIAG contains 100 indicators.

1. **Safety & Rule of Law (**Rule of Law, Accountability, Personal Safety & National Security
2. **Participation & Human Rights (**Participation, Rights &Gender)
3. **Sustainable Economic Opportunity (**Public Management, Business Environment, Infrastructure &Rural Sector)
4. **Human Development**.(Welfare, Education &Health)

For this study accountability under safety & rule of law category is used as a proxy of Mo Ibrahim corruption index

Table A4.1: Measurent of Mo Ibrahim Corruption Indicators

Safety & Rule of Law			
Rule of Law	**Accountability**	**Personal Safety**	**National Security**
Judicial Independence	Access to Information	Safety of the Person	Government Involvement in Armed Conflict
Judicial Process	Online Public Services	Police Services	Domestic Armed Conflict
Access to Justice	Public Sector Accountability & Transparency	Social Unrest	Violence by Non-state Actors
Property Rights	Accountability of Public Officials	Crime	Cross-border Tensions
Transfers of Power	Corruption in Government & Public Officials	Political Violence	Internally Displaced People
Multilateral Sanctions	Corruption & Bureaucracy	Human Trafficking	Political Refugees
	Diversion of Public Funds		
	Corruption Investigation		

Table A4.2: Measurement of Corruption Indicators

Measurement	Source	Objective	Methodology	Surveys &Sources	Reading of the Index
Mo Ibrahim Accountability Index	Mo Ibrahim Governance indicators	To access the extent of accountability which is a proxy of corruption	Composite index that uses 8 proxy indicators to measure accountability (corruption). This is measured using 32 independent sources from African states. Annual refinement are made to the index based the	i. Access to information ii. Online Public Services iii. Public Sector accountability & Transparency iv. Accountability of Public Officials v. Corruption in Government & Public Officials vi. Corruption& Bureaucracy vii. Diversion of Public Funds viii. Corruption Investigation	Measured between 1-100, where 1 is least in terms of accountability (High Corrupt) &100 is highest in terms of accountability (Low Corrupt) country.
Control of Corruption	World bank governance indicators	Address the extent to which public power is exercised for private gain	Analyses petty and grand corruption. Combines different 25 different sources and surveys from business leaders, general public and country analyst. with different weighting and depending on its estimated precision and country coverage	Control of Corruption captures perceptions dataset summarizing the views on the quality of governance provided by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. These data are gathered from a number of survey institutes, think tanks, non-governmental organizations, international organizations, and private	Ranges -2.5 to 2.5. Where -2.5 is least in terms of control of corruption (High Corrupt) &2.5 is highest in terms of control of corruption (Low Corrupt) country.

				sector firms.	
Corruption perception Index	Transparency International	Assesses the level of corruption in the public sector only	Measures the level of corruption in countries based on expert perception. Quantitative, calculated using data from 14 sources originated from 12 independent institutions. All sources measure the overall extent of corruption (frequency and/or size of bribes) in the public and political sectors and all sources provide a ranking of countries.	Misuse of public power for private benefit (bribery, kickbacks,) and anticorruption policies from these institutions: i. Political and Economic Risk Consultancy (based in Hong Kong) ii. The PRS Group, Inc., (based in US) iii. World Economic Forum iv. World Bank v. World Justice Project (based in US) vi. African Development Bank (based in Ivory Coast) vii. Bertelsmann foundation (based in German viii. Economist Intelligence Unit (based in UK) ix. Freedom House (based in US) x. Global Insight (based in US) xi. International Institute for Management xii. Development (based in Switzerland)	Measured between 1-100, where 1 is least in terms of corruption perception I index (High Corrupt) &100 is highest in terms of corruption perception I index (Low Corrupt) country.

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Appendix 4: Panel Unit Root Test

Table A4.1: Panel Unit Root Test

Variable	Type of test	Form of test	Test statistics	P-Value	Conclusion
Economic growth	Levin, lin & chu	Intercept	-1.9995**	0.0228	1st Difference
		Trend & Intercept	-9.6519	0.0000	
Government expenditure	Levin, lin & chu	Intercept	-1.9995**	0.0228	1st Difference
		Trend & Intercept	-9.4457***	0.0000	
Control of corruption	Levin, lin&chu	Intercept	-3.3893***	0.0004	1st Difference
		Trend & Intercept	-20.1176***	0.0000	
Corruption perception index	Levin, lin& chu	Intercept	-2.5746***	0.0050	1st Difference
		Trend & Intercept	-4.0630***	0.0000	
Mo Ibrahim	Levin, lin & chu	Intercept	-2.9864***	0.0014	1st Difference
		Trend & Intercept	-4.3567	0.0000	
Rule of law	Levin, lin, & chu	Intercept	-2.8529***	0.0022	Level
		Trend & Intercept	-4.4294***	0.0000	
Government effectiveness	Levin, lin& chu	Intercept	-4.2344***	0.0000	1st Difference
		Trend & Intercept	-4.0942***	0.0000	
Revenue	Levin, lin& chu	Intercept	-2.1957 **	0.0141	Level
		Trend & Intercept	-3.4175***	0.0003	
Debt	Levin, lin& chu	Intercept	-2.7166***	0.0033	1st Difference
		Trend & Intercept	-10.9921	0.0000	
Trade openness	Levin, lin & chu	Intercept	-1.7192**	0.0428	1stDifference
		Trend & Intercept			
Gini index	Levin, lin& chu	Intercept	-5.2810***	0.0000	Level
		Trend & Intercept	-4.1901***	0.0000	
Inflation		Intercept	-4.0990***	0.0000	Level
		Trend & Intercept	-11.5440 ***	0.0000	
Capital formation	Levin, lin& chu	Intercept	-1.7338**	0.0415	1st Difference
		Trend &	-2.8515***	0.0022	

Variable	Type of test	Form of test	Test statistics	P-Value	Conclusion
		Intercept			
Human Capital	Levin, lin& chu	Intercept	-2.9233***	0.0017	1st Difference
		Trend & Intercept	-10.1576***	0.0000	
Politics	Levin, lin, chu	Intercept	-2.2995**	0.0107	1st Difference
		Trend & Intercept	-7.8036***	0.0000	

***** Significant at 1percent; ** 5percent; * 10percent;**
Source: Study data (2019)

Appendix 5: Multicollinearity VIF test

Table A4.1: VIF Correlations for Control of corruption

Variable	Control of corruption	Corruption Perception Index	Mo Ibrahim Accountability index
	VIF	VIF	VIF
Control of corruption	1.51	1.81	1.32
Economic growth	5.49	5.47	5.45
Rule of law	8.03	5.79	8.00
Government effectiveness	1.30	1.27	1.29
Capital Formation	1.29	1.43	1.26
Gini index	8.90	9.11	9.08
Inflation	1.65	2.17	1.80
Political Stability	1.74	1.68	1.73
Human Capital	5.13	5.20	5.13
Mean VIF test	3.89	3.99	3.90

Table A4.2: VIF Correlations for corruption perception index

Variable	Govt Exp using Control of corruption	Govt Exp. Using CPI	Govt Exp using Mo Ibrahim Acc.index
	VIF	VIF	VIF
Government expenditure	4.65	4.96	4.56
Corruption indicator	1.31	1.82	1.44
Economic growth	5.85	7.12	5.86
Trade	1.83	1.45	1.64
Inflation	1.38	1.58	1.36
Debt	1.29	1.32	1.30
Capital formation	1.17	1.20	1.25
Revenue	7.38	8.28	7.49
Mean VIF test	3.07	3.47	3.11

Table A4.3: VIF Correlations for Mo Ibrahim accountability Index

Variable	**GDP using Control of corruption**	**GDP. using Corruption Perception Index**	**GDP using Mo Ibrahim Accountability index**
	VIF	**VIF**	**VIF**
Lagged Economic growth	3.50	3.87	3.51
Government expenditure	7.22	7.50	7.25
Corruption indicator	1.27	1.38	1.44
Trade	1.98	1.85	2.18
Debt	1.25	1.24	1.24
Capital formation	1.16	1.16	1.22
Revenue	8.87	9.12	8.67
Mean VIF test	3.07	3.47	3.64