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**DETERMINANTS OF CORRUPTION IN EAST AFRICAN COMMUNITY STATES**

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***Abstract***

*The East African Community states present high levels of corruption. Corruption is a daunting hindrance to sustainable development, education, health care and poverty reduction. It is a great impediment to the Sustainable Development Goals and is one of the main factors that has prevented poor and developing countries from catching up with the developed ones. In the effort to curb the vice, there has been unending debate and there is no consensus on the true determinants of corruption. According to the World Bank although corruption is an international issue affecting all countries of the world at different degrees, the determinants of corruption are not the same in all countries. This necessitated a study to establish the determinants of corruption. The specific objective of this study was to establish the determinants of corruption in the East African community states. The study employed non-experimental research design using extended Becker theory of crime. The study employed system generalized methods of Moments estimation technique to establish the determinants of corruption. The findings revealed that economic growth is one of the important determinants of corruption. The other determinants include government effectiveness, rule of law and human capital.*

***Keywords:***

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## Introduction

World Bank defines corruption as the abuse of public office for private gains. Corruption is a major obstacle to economic development. It reduces domestic investment, discourages foreign direct investment, inflates government spending and shifts government spending away from education, health and infrastructure maintenance toward less efficient public projects (Wei, 1999). Corruption could be a symptom of many ills of a society. Hence, the fight against corruption has to be multi-fronted. While laws and law enforcement are indispensable, countries fighting corruption should also pay attention to the factors that determine the level of corruption. According to World Bank (2013) corruption is a daunting hindrance to sustainable development, education, health care and poverty reduction.

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 cooperation making it the first legally binding global instrument to fight corruption. In 2018, Transparency International ranked the United States as the 22nd least corrupt country, falling from 18th since 2016. The United States ranked between France (21) and the United Arab Emirates (23). Additionally, in 2019, Transparency International also stated that the United States is experiencing threats to its system of checks and balances, along with an erosion of ethical norms at the highest levels of power.

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 African nations. Some public officials accept or extort bribes before delivering service that they are under obligation or duty to do or not to. Aidt, Dutta and Sena (2008) observed that some public officers in developing nations such as African countries exercise patronage and nepotism where theft of state assets or diversion of state resources occurs. In Sub Saharan Africa corruption and bribery are perceived to be getting worse and trust in governments is falling where some sections of the population engage on corruption to access public institutions and services (Ntwari, 2015; Chêne, 2018).

The East African Community states have experienced high levels of corruption. Corruption has been a hindrance to sustainable development 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 the developed ones (Gray & Kaufmann, 1998). 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 as a result of globalisation and technological advancement (Hope, 2014). Since early 1990s, countless efforts by international, regional and national bodies have been put in place to minimise and eventually eradicate corruption. This is because it is considered as one of those unethical departments 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: Mo Ibrahim index, corruption perceptions Index and control of corruption. This study therefore employed all indices. Mo Ibrahim accountability index ranks states on a scale of 1 indicating highly corrupt to 10 indicating corruption Free State while control of corruption is measured on a scale of -2.5 indicating highly corrupt state and 2.5 showing less corrupt state.

#### ***Determinants of Corruption in EAC States***

In 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). In addition, 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) posits that although corruption is an international issue affecting all countries of the world at different degrees, the determinants of corruption are not the same in all countries.

While studies have previously documented the causes of corruption both in developed and developing countries most of them have largely analysed economic determinants of corruption and are inclined to detect the economic consequences of corruption (Orayo & Mose, 2016). On the other hand, these studies have tended 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.

From the literature, 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 (Brown *et al.*, 2005; Shabbir, & Anwar, 2007); Orayo & Mose, 2016). Further, among non-economic determinants, studies suggest that corruption can be determined by the socio-political and religious determinants in the form of democracy, press freedom and share of population having affiliation with particular religion (Chaudhry & Shabbir, 2007).

The EAC states want to follow the path leading to targeted and sustainable economic growth over time (Orayo & Mose, 2016). To achieve this, the policy makers require knowing the determinants of corruption, because they are the key root causes that can determine the direction or the levels of corruption which may vehemently undermine sustainable growth as envisioned in these countries. This study will clearly show whether the contribution of economic, political and social factors is more conspicuous, as claimed in the literature, compared to non-economic factors in

determining the level(s) of corruption in EAC states.

**Statement of the Problem**

Most of the regional blocs in Africa that are advocating for integration especially EAC are ranked among the top regional hubs that host most corrupt countries globally (Mwakikagile, 2014). From the available statistics, the region has over time been characterised by high corruption levels (Transparency International, 2015). In the effort to curb corruption there is need to fully understand the true determinants of corruption (Elbahnasawy & Revier, 2012). Accordingly, the World Bank (2000) posits that 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 analysed the causes of corruption both in developed and developing countries, most of them have largely analysed economic determinants of corruption and are inclined to detect the economic consequences of corruption (Elbahnasawy & Revier, 2012). On the other hand, these studies have tended to reveal the economic causes of corruption. These studies however have been conducted in developed countries and Sub-Saharan Africa with little focus in EAC states. Similarly, some of these studies are either country level studies or based on one measurement indicator for corruption.

A comprehensive study to empirically establish the determinants using a number of key corruption indicators is therefore needed. This study is imperative in the region with a view of proposing appropriate policy choices in the wake of various governance reforms as well as increased advocacy for regional integration.

**Objectives of the Study**

The objective of this study was to investigate the determinants of corruption in the East African Community States.

**Literature Review**

*Theoretical Review*

*Becker Theory of Crime*

The theory of crime by Becker (1968) follows the standard principle -agent works of Shleifer and Vishny (1993). The government produces one homogenous good with 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.

$$P_1 = P + B \dots\dots\dots (1)$$

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

$$B < P \dots\dots\dots (2)$$

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), 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.

### ***Empirical literature***

Collier (2000) studied how to reduce corruption in Sub-Saharan countries. The study found 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. 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 tends to dominate in political arena, business and in daily lives of general public. The study failed to bring to the core the main socioeconomic and political variables that explain corruption.

Lambsdorff (2005) investigated the consequences and causes of corruption. The study reviewed studies on the effects, consequences and causes of corruption. 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 study confirmed the premise that corruption continues to threaten development.

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.

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 a regional level. The study used dynamic econometric model ARDL for panel data analysis of corruption in Italian regions. The study developed some hypotheses on institutional changes, social network and political competition as some determinants of corruption. Further the study established that public expenditure and GDP was significantly low in explaining corruption, while political, 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 United States. 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 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. The study showed that there is no statistical significant relationship between corruption measured by the CPI as a dependent variable and the human development index, press freedom index and inflation rate as independent variables. The study basically considered Arab countries 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. 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. The study dwelled on socio-demographic determinants of corruption in Kenya and therefore limited in scope.

Ghaniy and Hastiadi (2016) employed a cross sectional data in analysing corruption. The study analysed various political, social and economic determinants. 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. Ordinary least squares (OLS) method and tests on cross-section data was used. 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. 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.

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: rule of law, government effectiveness and public accountability are the main factors that negatively correlate with the level of corruption within a country.

Abdelbaki (2017) investigated 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.

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

Maguire (2018) did a study to establish determinants of corruption. The study used multi-variable regression analysis of 106 independent variables to determine their relationship with control of corruption index. The rule of law, regulatory quality and police reliability while Marxist and conflict had a

negative relationship. The study mainly relied on control of corruption index and no other indices like Mo Ibrahim.

Tyburski, Egan and Schneider (2020) did a sub national 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. 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.

Mangafić and Veselinović (2020) investigated the determinants of corruption at the individual level in Bosnia-Herzegovina. 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.

## **Research Methodology**

### ***Theoretical Framework***

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:

$$E[U] = \rho U(Y_{it} - f) + (1 - \rho)U(Y_{it}) \dots \dots \dots (3)$$

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) (that is the monetary equivalent from an offense), and  $f$  is the monetary equivalent of the punishment.  $\rho$  is the probability of being caught and convicted as given in equation 4 and 5.

$$\frac{\partial yE[U]}{\partial \rho} = U(Y_{it} - f) - U(Y_{it}) < 0$$

equivalent to  $\frac{\partial C}{\partial \rho} < 0 \dots \dots \dots (4)$

$$\frac{\partial yE[U]}{\partial f} = -\rho U(Y_{it} - f) < 0$$

equivalent to  $\frac{\partial C}{\partial f} < 0 \dots \dots \dots (5)$

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

As long as the marginal utility of income is positive, an increase in either  $\rho$  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 and probabilities of arrests, convictions, and punishment for individuals or society. For individuals or society to indulge in corruption, they make a cost benefit analysis as given in equation 6

$$Net\ Social\ Cost = SC(C) - SB(C) \dots \dots \dots (6)$$

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

$$SB' > 0 \quad SB'' < 0$$

Where  $SB$  is social benefit,  $SC$  is the social cost and  $C$  is number of corruption cases.

Equation 6 shows that if  $SC(C) < SB(C)$ , 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  $SC'' > 0$ ,  $SB'' < 0$ , meaning that the social benefit and social cost obey the law of diminishing returns. If  $SC(C) < SB(C)$ , there is incentive for committing crime (corruption) or illegitimate income is more than the legitimate income. If  $SC(C) > SB(C)$ , 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;  $\rho$ ,  $f$ ,



and Y the (Society) market offenses (corruption) function as given in equation 7.

$$C = C(\rho, f, Y_{it}) \dots \dots \dots (7)$$

Where, C is the number of offenses (corruption cases) he would commit during a particular period,  $\rho$  is probability of conviction per offense,  $f$  his punishment per offense, Y legitimate/illegitimate income. For individuals to commit crime they make a cost benefit analysis.

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 8.

$$C = F [DP, Y, \rho, f, \mu] \dots \dots \dots (8)$$

Where C is corruption cases, DP is discretionary powers, Y is legitimate/illegitimate income (economic rent),  $\rho$  is probability of being detected if convicted, and F is punishment if caught engaging in corruption.  $\mu$  other variables such as strength of political institutions.

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

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  $\rho$ , F and  $\mu$  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 proxied 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).

**Empirical Model**

The empirical model extends the policy-oriented theory of corruption given by Jain (2001) by including other independent variables that determine corruption as identified from the theoretical review. 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. 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.

The model estimated is as shown in equation 9.

$$\begin{aligned}
 Corruption_{it} = & \beta_0 + \\
 & \beta_1 Lagged\ Corruption_{it} + \\
 & \beta_2 Economic\ Growth_{it} + \\
 & \beta_3 Human\ capital_{it} + \\
 & \beta_4 Gov\ Effectiveness_{it} + \\
 & \beta_5 Rule\ of\ law_{it} + \\
 & \beta_6 Capital\ farmation_{it} + \\
 & \beta_6 Gini\ Index_{it} + \beta_6 Economic\ stability + \beta_6 political\ stability + \\
 & \varepsilon_{1it} \dots \dots \dots (9)
 \end{aligned}$$

Where  $i=1 \dots N$ ,  $t=1 \dots T$ ,  $\beta_0$  and  $\beta_1$  to  $\beta_6$  are parameters to be estimated, while  $\varepsilon_{1it}$  represents disturbance terms. *Corruption* *it* include corruption levels, measured by control of corruption, corruption perception index and Mo Ibrahim index.

In order to estimate the coefficients of the empirical models presented in equation 9, 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 and Bover (1995) and Blundell and 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).

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.

**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 are shown in Table 1.

**Table 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	1 <sup>st</sup> Difference
		Trend & Intercept	-9.6519	0.0000	
		Trend & Intercept	-9.4457***	0.0000	
		Intercept	-3.3893***	0.0004	1 <sup>st</sup> Difference

Variable	Type of test	Form of test	Test statistics	P-Value	Conclusion
Control of corruption	Levin, lin&chu	Trend & Intercept	-20.1176***	0.0000	
Corruption perception index	Levin, lin& chu	Intercept	-2.5746***	0.0050	1 <sup>st</sup> Difference
		Trend & Intercept	-4.0630***	0.0000	
Mo Ibrahim	Levin, lin & chu	Intercept	-2.9864***	0.0014	1 <sup>st</sup> 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	1 <sup>st</sup> Difference
		Trend & Intercept	-4.0942***	0.0000	
		Trend & Intercept			
Gini index	Levin, lin& chu	Intercept	-5.2810***	0.0000	Level
		Trend & Intercept	-4.1901***	0.0000	
Economic stability		Intercept	-4.0990***	0.0000	Level
		Trend & Intercept	-11.5440 ***	0.0000	
Capital formation	Levin, lin& chu	Intercept	-1.7338**	0.0415	1 <sup>st</sup> Difference
		Trend & Intercept	-2.8515***	0.0022	
Human Capital	Levin, lin& chu	Intercept	-2.9233***	0.0017	1 <sup>st</sup> Difference
		Trend & Intercept	-10.1576***	0.0000	
		Trend & Intercept	-7.8036***	0.0000	

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

Gini index, rule of law and economic stability were stationary at level or integrated of order

zero I (0). Economic growth, Mo Ibrahim accountability index, control of corruption, government effectiveness, capital formation, and human capital were non-stationary at level but became stationary at first difference, hence integrated of order one.

**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.

*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. 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 2.

**Table 1: VIF Test**

	CC	CPI	MOI
	Mean VIF	Mean VIF	Mean VIF
Determinants of corruption	3.89	3.99	3.90

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

VIF multicollinearity results for each variable presented in Table 2 show that there is no multicollinearity problem. This is because the VIF Test results show all variance inflation factor of less than 10.

*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 serial correlation test was carried out and the results presented in Table 3.

**Table 2: Serial Correlation Results**

	Order	CC		CPI		MOI	
		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

**Source: Researcher, (2019)**

Table 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 the study did not reject the null hypothesis for the Arellano–Bond test statistics for second-order serial correlation in residuals indicating that there exists no autocorrelation.

*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.

**Table 3: Overall Significance Test Results**

	CC		CPI		MOI	
	Prob>		Prob>		Prob>	
	Wald2(4)	chi2	Wald2(4)	chi2	Wald2(4)	chi2
Determinants of corruption	32.62	0.000	282.04	0.000	49.09	0.000

**Source: Researcher, (2019)**

Table 4 shows the Wald Chi-square test of joint significance. The models had p-values of less than 0.5 hence the null hypothesis was not rejected. The model was well specified.

**5.5.4 Model Sargan Test Results**

Table 5 shows the Sagan J-Statistics for over identifying restriction.

**Table 4: 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

**Source: Researcher, (2019)**

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. Sagan J-Statistics tests for over identification of the determinants of corruption as given in Table 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.

**Empirical results**

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 control of corruption indicators were used to measure corruption. The results for the determinants of corruption are presented in Table 6

**Table 5: Results for the Determinants of Corruption**

System dynamic-data estimation-One-step results						
	Control of corruption		Corruption Index	perception	Mo Ibrahim Index	
	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	-77.418** (31.969)	0.015	-20.9212** (8.1788)	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 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 index by 0.2441 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 of control of corruption index (perceived to be least corrupt) and -2.5 is least performing in terms of 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 points at 5 percent significance level, holding other factors constant. The result reveal that in the long run; previous period control of corruption, rule of law, inflation and political stability were insignificant at 5 percent significance level with -0.074, 0.0008, 0.0075 and 0.134 coefficients respectively.

When corruption perception index is used, the 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. A 1 point increase in previous

corruption perception index increases the current corruption perception index by 0.5891 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. A 1 point increase in the previous Mo Ibrahim index increases the current Mo Ibrahim index by 0.6386 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 findings support 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 growth rate 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. A 1 point increase in government effectiveness will decrease control of corruption index by -0.3789 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. A 1 point increase on government effectiveness reduces corruption perception index by -5.0176 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.

A 1 point increase in government effectiveness reduces Mo Ibrahim index by -2.2649 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. 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 index by 0.0062 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 since investments only increase when there is less corruption. Reduced corruption is an incentive to more investments hence more capital formation. Thus the findings reveals 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 index by -0.1433 points. On rescaling the control of corruption, it means a 1 percentage increase in capital formation will increase corruption index by 0.1433 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 points. On rescaling the Mo Ibrahim index, it means a percentage increase in capital formation will decrease Mo Ibrahim index by 0.0881 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. A 1 point increase in rule of law reduces the corruption perception index by -3.4687 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. A 1 point increase in political stability index will

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

A 1 point increase in political stability will increase corruption perception index by 1.1866 points. This implies that if the country is more stable politically, corruption will decrease. This result pointed is in line with the other indicators of corruption but differed in magnitude and level of significance. The result is 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 a 1 percentage decrease in human capital will lead to 7.7418 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 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.

Furthermore, inflation had positive and statistically significant coefficient of 0.1548 at 5 percent significance level. Thus, 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.

### Conclusions and Policy Implications

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 economic growth is one of the determinants of corruption. The finding also suggests some other variables which determine the level of corruption. These variables include; government effectiveness, rule of law and human capital.

The findings of this study have some policy implications to various EAC states governments in combating corruption. East Africa Community state governments should endeavor 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), 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.

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