THE INFLUENCE OF CORRUPTION ON SELECTED MACROECONOMIC VARIBLES AND ECONOMIC GROWTH NEXUS AMONG COMESA COUNTRIES

BY

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DECLARATION

Declaration by Candidate

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DEDICATION

This research is dedicated to the memory of my father who believed in education and invested all for the pursuit of our studies and my mother who loved, encouraged and believed in me and sacrificed towards this realization. I also dedicate this research to my family for their support and sacrifice during the many hours i spent writing this thesis denying them the quality time they had a right to. To my dear wife, my son Shawn who never understood why a PhD should take so many years to complete and my daughter Daisy who must have learnt a lot from my dedication as she applied it to her own work.

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ABSTRACT

Economic growth has remained an elusive issue in all economies in the world for a long period of time with empirical studies about factors determining economic growth giving mixed results in different countries. Common Market of Eastern and Southern Africa (COMESA) was founded to foster and promoting joint development in all fields of economic activity and the joint adoption of macro-economic policies and programmes to raise the standard of living of its peoples among its members states. Among others, emphasis was put on mobilizing domestic financial resources, mobilizing international resources, and promoting international trade as the engine of economic growth. However, it is not clear if these policies are a panacea to economic growth issue in COMESA countries and economic growth in these countries has remained a challenging issue in all economies. This study analyzed determinants of economic growth. The specific objectives were to establish the significant effect of investor protection, credit to private sector and foreign exchange rates on economic growth. Further the study sought to evaluate the moderating effect of corruption. Finally tested the cointegrating relationship. The study was guided by Rostow Stages of Development, Solow's Classic Model, Cognitive Psychology of Corruption and Purchasing Power Parity theory. This study adopted positivist research paradigm. Explanatory research design was applied for the period 2000 – 2020 for 18 COMESA countries. Data was collected from World Bank and Transparency International database. Results indicated that stationarity was observed at levels. Johansen Fisher cointegration confirmed long run relationship among the variables. Hausman suggested random effects was appropriate over fixed effects. Multivariate linear regression assumptions such as normality, multicollinearity, heteroscedasticity, and serial correlation were tested. From output, Credit to private sector ($\beta = .0267, p = .000$), and foreign exchange rate ($\beta = .0003, p = .004$) had a positive and significant effect on economic growth while strength of investor protection ($\beta = -.4568, p = .000$), and corruption ($\beta = -.2179, p = .037$), directly had a negative and significant influence on economic growth. Further, corruption significantly moderated the link between investor protection and foreign exchange rates on economic growth with respective coefficient and their probabilities, ($\beta = -.140, p = .004$) and ($\beta = .0003, p = .000$). The study concluded by expounding that an increase in credit to private sector spurs economic growth. This is because investors are willing to invest in more risky venture while encouraging safe borrowers. A depreciation of the currency can make a country's exports cheaper and imports more expensive. The financial sector, especially in the formal sectors of the economy, is critical in channeling savings into productive investment. The banking sector is widely regarded as an important economic conduit for financial intermediation. Credit to private sector increases a country's productive capacity. The result of this research adds new knowledge by analyzing the determinants of economic growth among COMESA countries. Results enables macroeconomists, policy makers and central banks of all the nations to deeply understand the role of investor protection, credit to private sector, foreign exchange rate, and the negative impacts of corruption to spur economic growth.

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ABBREVIATIONS AND ACRONYMS

ARDL	Autoregressive Distributed Lag
COMESA	Common Market for Eastern and Southern Africa
CPI	Corruption Perception Index
CPS	Credit to Private Sector
CUSUM	Cumulative Sums of Squares
DRC	Democratic Republic of Congo
ECB	European Central Bank
ECG	Economic Growth
ERA	Economic Report of Africa
FE	Fixed Effects
FER	Foreign Exchange Rates
GDP	Gross Domestic Product
HDI	Human Development Index
IMF	International Monetary Fund
INP	Investor Protection
LDCs	Least Developed Countries
MDGs	Millennium Development Goals
MENA	Middle East and North African Countries
MNCs	Multinational Corporations
NEPAD	New Economic Partnership for Africa's Development
NICs	Newly Industrializing Nations
OECD	Organization for Economic Co-operation and Development
PTA	Preferential Trade Area
RE	Random Effects

RE	Random Effects
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
SLS	Two Stage Least Squares
SSA	Sub-Saharan African countries
UNDP	United Nation Development Programme
UNECA	United Nations Economic Commission for Africa
US	United States
VAR	Vector Autoregressive
WEO	World Economic Outlook

OPERATIONAL DEFINITION OF TERMS

Corruption - Corruption can be captured or measured from different dimensions; the following are some of the indicators to capture corruption perception index (CPI). These includes bribery, diversion of public funds, prevalence of officials using public office for private gain without facing consequences, lack of governments' ability to contain corruption and enforce effective integrity mechanisms in the public sector, red tape and excessive bureaucratic burden (Andvig et al., 2000)

Credit to private Sector - Refers to financial resources provided to the private sector by financial corporations, such as loans, purchases of non-equity securities, trade credits, and other accounts receivable, which establish a claim for repayment (Kiriga, Chacha & Omanyo, 2020; Nzomoi, Were, & Rutto, 2012)

Economic Growth- Economic growth means increase in welfare of economy that arises from increased amount of goods and services produced by an economy over a period. Economic growth encompasses the process and policies by which a country improves its people's economic, political, and social well-being (Aron, 2010). According to Mankiw (2014), economic growth is defined as an increase in real GDP (gross domestic product)

Foreign Exchange Rate- Is exchange rate is the rate at which one currency is exchanged for another currency. Currencies are most commonly national. This is the value of countries currency against US dollar (Chen, 2012; Baiden, J. E. 2011).

Gross Domestic Product – is the total value of a country's output or market value of all final goods produced by the factors of production within the borders of that country in a given year.

Investor Protection- Refers the extent to which the commercial law and its enforcement protect investors from expropriation. Essentially, it refers to the actions taken with the goal of bringing and maintaining transparency in procedural aspects when dealing with investors through some regulatory bodies and appropriate legislation (Chu et.al., 2017)

Moderation- This is unconditional effect of independent variables on the dependent. The effect of a moderating variable is characterized statistically as an interaction. A moderator analysis is used to determine whether the relationship between two variables depends on (is moderated by) the value of a third variable (Cohen *et al.*,2003).

CHAPTER ONE

INTRODUCTION OF THE STUDY

1.1 Overview

This section of the thesis presents the background to the study, problem statement, objectives of the study, and hypotheses of the study and justification of the study

1.2 Background to the Study

There several evolutionary definition and indicators of measuring economic growth. Gross domestic product, investments, national revenue, aggregate supply,GDP per capita, and unemployment rate are some of these indicators. The gross domestic product (GDP) is believed to be one of the most often utilized metrics of a country's economic growth (Haller, 2012). There are several economic data that support all macroeconomic growth explanations (Kira, 2013). The macroeconomic literature has provided a wealth of evidence suggesting demand side factors have a significant impact in a country's economic growth rates variation (Dutt, 2016). Most emerging countries, notably in Africa, are making domestic macroeconomic structural adjustments to enhance their economies in order to address most socioeconomic concerns.

Economic growth is defined as the continuous improvement in the capacity to meet demand for goods and services as a result of greater production size and improved productivity (product and process innovations), which is usually measured over time. To put it another way, it is the calculation of the annual percentage rise in real GDP during a given time period. Varied people have different ideas about what economic growth is and how to quantify it, but the most common definition is expansion in the economy's long-run productive capacity, which is commonly measured by real GDP growth.

Economic growth is the most effective tool for alleviating poverty and raising living standards in emerging countries (Jobs, 2008). Rapid and sustained growth is crucial to making speedier progress toward the Millennium Development Goals, according to both cross-country research and country case studies. Growth has the potential to create virtuous spirals of wealth and opportunity. Strong economic growth and job prospects encourage parents to invest in their children's education by enrolling them in school. This might lead to the creation of a powerful and rising group of entrepreneurs, putting pressure on the government to reform governance. As a result, strong economic growth fosters human development, which in turn fosters economic growth.

The experiences of developing countries in the 1980s and 1990s demonstrate that growth might be accompanied by either increasing or reducing inequality (Ravallion, 2001). Inequality rates in many developing countries are comparable to or lower than in industrialized countries. A number of cross-country studies have concluded that growth has no beneficial or negative impact on inequality (Dollar & Kraay, 2002). Asian countries are progressively addressing the 'inclusive growth' agenda (Jobs, 2008). India's most current development plan has two key goals: increasing economic growth and making it more inclusive, a program that is being replicated across South Asia and Africa. Future progress will be dependent on a more globalized environment that presents both new opportunities and new problems. New research promises to improve both the production and service industries.

According to Economic Report for Africa (ERA) (2015), Africa had strong economies in 2000s and its medium-term growth prospects are good even though there are global economic hurdles. The growth has not given Africa commensurable benefit in economic diversification, better jobs, and rapid social development. Africa’s growth performance during the period 2011-2017 only reinforces the call for urgent structural

transformation and formation of regional economic blocks to foster international trade. Increased domestic demand, primarily driven by the rising middle class, improved regional business environment and macroeconomic management, increased public investment, particularly in infrastructure, a thriving services sector, and strong trade and investment ties with emerging economies are expected to keep the continent's strong growth going in the medium term. (ERA, 2015).

Africa, on the other hand, requires more than marginal growth. The continent must achieve economic growth that is long-term, inclusive, and revolutionary. Industrialization is required to restructure the African economies structurally (WEO, 2016; 2017). Raw and unprocessed commodities account for the majority of Africa's exports. This paradigm is not conducive to achieving a level of economic progress that can be sustained. This is the foundation of ERA's (2013) recommendations for commodity-based industrialization, which highlighted the critical role of industrial policy in the structural change process.

One of the United Nations' Sustainable Development Goals (SDGs) from 2000 is to cut the proportion of people living in severe poverty in half by 2030. Countries must enhance their economic growth to accomplish the SDGs, with a target of achieving and maintaining an average real GDP growth rate of 7% per year by 2015 (UNECA, 2007). Despite efforts by countries in the region to expand their economies, the results so far have fallen short of the 7% target required to accomplish the SDGs. In fact, COMESA's overall real GDP growth was 1.3 percent in 2000, 3.3 percent in 2001, 2.1 percent in 2002, 2.0 percent in 2003, 3.9 percent in 2004, 4.2 percent in 2005, 4.7 percent in 2006, and 5.0 percent in 2007, with an average of 3.3 percent for the period 2000-2007; and, with the exception of Sudan and Ethiopia, whose average real GDP growth was 8.0 percent and 7.80 percent respectively for that period, the rest of the

region's performances are still below COMESA countries will not meet the SDGs by 2030 unless economic growth is expedited.

In order to boost economic growth and accomplish the SDGs by 2030, COMESA countries were to implement plans and policies. However, this objective was not met. The openness to trade and investment through exports, as well as the encouragement of FDI through the so-called export-led and FDI-led growth hypotheses, are among the strategies recommended to boost economic growth in developing nations.

Following the growth records of Asian Newly Industrializing Countries (NICs) over the last decades, particularly Hong Kong, Singapore, Korea, Taiwan, Malaysia, and Thailand, economic growth has been the subject of debates in recent decades, with the World Bank advocating growth records as the result of policies promoting exports.

The link between exports and economic growth is also a point of contention: should a country promote exports in order to accelerate economic growth, or should it prioritize economic growth, which will in turn create exports? Some argue that encouraging exports can help a country's economy grow faster, resulting in the "Export-led Growth Hypothesis." (Awokuse, 2002; Kónya, 2002; Yenteshwar, 2003; Sharma and Panagiotidis, 2004). Others, however, believe the connection can also be traced from economic growth to exports ("growth-driven exports hypothesis"). In fact, according to neoclassical trade theory, economic expansion will stimulate demand for exports by affecting supply side (factor endowments), giving the country a strong export production base that is internationally competitive (Baharumshah and Rashid, 1999; Mahadevan, 2007).

According to the findings, economies should tighten investor protection regulations in order to improve local financial growth, which is a crucial driver of local economic

development. According to Chu et al., (2017), countries with a common law background have significantly better investor protection, which leads to more developed equity markets and consequently economic prosperity. Several empirical investigations have found that economic progress can be accomplished when investors are protected and given a favorable investment environment.

The level of investor protection has an impact on cross-country economic growth variations: countries with high investor protection grow rapidly than those with inadequate investor protection. The study further argued that Investor protection measures are inextricably linked to financial development. (Haidar, 2009). In addition, the theory of law and finance suggests that effective protection of personal property and investor interests increases investors' confidence and involvement in financial markets, as well as the supply of funds to enhance the development of the financial system, which in turn contributes to the growth of a country's economy.

Credit to private sector is known as financial resources given to the private sector, including loans and advances, non-equity securities purchases, trade credits, and other receivables, that establish a claim for recovery. In a variety of ways, financial institutions contribute significantly to people's socio-economic development. According to Joshi (2016) economic growth refers to an economy's ability to increase its output of goods and services over a set period by utilizing available factor inputs such as capital and labor.

Financial development is beneficial in increasing demand for goods and services, and so plays an important part in sustaining a country's economic prosperity (Dinh & Nguyen, 2019). As the banking sector collects little savings from ordinary citizens and provides loans to them for a variety of objectives. Most notably, it provides direct

financial assistance to the business and agricultural communities. As a result of the increased role of the banking sector in the economy, demand for products and services is likely to rise. Thus, financial institutions help to keep money flowing and contribute to the creation of tangible assets in the economy (Haralayya & Aithal, 2021).

Economies which rely on exports as a source of fiscal and foreign exchange earnings especially the oil producing and exporting countries are adversely affected by consistent volatility of oil prices. Therefore, foreign exchange rate contributes significantly to both growth and stagnation of the economy. Appreciation (depreciation) lowers (raises) significantly annual income thus reduces economic growth (Aloui & Shahbaz, 2018). There is indeed a close association between exchange rate changes and inflation rates both in theory and practice. Based on the law of one price, the Purchasing Power Parity theory of exchange rate regimes explains the change in the exchange rate because of the difference between both the (appropriately weighted) changes in "global" prices and the changes in domestic prices. Due to its widespread visibility, the nominal exchange rate is a key policy indicator. Economic managers must, however, concentrate on movements in the real exchange rate, which is the ratio of the price of tradable to the price of non-tradable, for the purpose economic growth analysis. A consistent disparity of pricing between an economy and the rest of world is represented by an inflated real exchange rate. The trend and level of economic activity, the allocation and level of spending, the distribution and level of factor payments, the structure and size of trade flows, the levels of international reserves and foreign debt, and (in more extreme cases) the emergence of parallel foreign exchange markets, monetary substitution, and capital outflows are all influenced by such discrepancies. Prolonged real currency

appreciation also undermines business and investor confidence, decreasing capital investment rates. The result is a decrease in growth of the economy.

Exchange rate enhances economic growth by boosting the volume of net exports. The fundamental cause for the increase in output level with the expansion of net exports is the change in relative prices of local and foreign goods as a result of the increase in exchange rates. The price of domestic items falls as the local currency depreciates, while the price of goods imported from other nations rises. As a result, an increase in net export volume precedes an increase in the growth rate of the economy. Depreciation, in other words, can be utilized as a policy instrument to boost economic growth. Furthermore, econometric evidence have emerged from mainstream studies demonstrating a favorable association between an increase in the exchange rate and an increase in net exports or economic growth. As a result, the positive impact of currency depreciation on economic growth has been well documented.

Corruption not only has an impact on the economic growth in terms of effectiveness and growth, but it also has an impact on equal and fair resource distribution across the citizenry, increasing income disparities, weakening the efficacy of social welfare programs, and eventually leading to decreased living standards (Song, Chang, & Gong, 2021). It is a serious phenomenon that affects all nations, but data demonstrates that it disproportionately affects impoverished people, impedes economic growth, and deflects cash from education, healthcare, and other government services (Gründler & Potrafke, 2019).

Corruption impacts numerous elements that drive economic growth, including investment, taxation, and the quantity, composition, and efficacy of government spending, ultimately raising the cost of production and reducing investment sales and

profits (Hakimi & Hamdi, 2017). The country's balance of payments account would be in deficit due to corruption, resulting in slowed growth. Theoretical studies suggest that corruption can alleviate government failure and boost economic growth in the near run, given exogenously determined inefficient bureaucratic norms and laws (Nguedie, 2018). However, because corruption is a cause of government failure, it should have a long-term negative influence on economic growth. In practice, economists are more concerned about the long-term consequences of corruption than the short-term ones. Several empirical research, including Wang, Zhang, & Wang (2018), Cielik, & Goczek (2018), and Borlea, Achim, & Miron (2017), have consistently demonstrated a negative association between economic growth and levels of corruption, with evidence of favorable effects being rare. Gründler & Potrafke (2019) in their study on corruption and economic growth found that corruption has a detrimental influence on investment and economic advancement.

Growth is crucial to a country's stability and prosperity in all economies around the world (Semuels, 2016). Strong growth trends frequently result in higher living standards for all members of society, while stagnant growth reduces a community's potential (Stone, 2017). The most popular method of analyzing growth in economic studies is through the use of a statistic called gross domestic product (GDP) (Ross, 2019). Despite the fact that the GDP does not accurately reflect economic welfare since it does not account for crucial factors like leisure time, environmental costs, and products bought outside of formal markets, it does offer useful information about the health and performance of the economy (Thoma, 2016).

The GDP can be impacted by a wide range of things, from natural calamities to technological developments. Corruption is one aspect that has generated discussion about how it affects GDP. Globally, there is widespread corruption, and top

government officials frequently engage in dishonest activities. The World Economic Forum estimates that corruption costs developing countries $1.26 trillion annually and costs the member states of the European Union 132 billion dollars annually in lost revenue due to theft and tax evasion (Fleaming, 2019). Clearly, corruption is rife in the modern world economy. Some, however, wonder whether corrupt actions genuinely have an impact on the expansion of an economy. Some people even think that corruption helps an economy flourish (Huang, 2012; Rock & Bonnett, 2004). The study that follows will examine these varied viewpoints in more detail and examine previous research on corruption and GDP. A brief, revised regression study on the relationship between corruption and growth will be presented as the study's conclusion. The findings will either support or refute the findings of earlier studies when creating an updated study, and they may also provide light on potential worldwide policy ramifications.

Numerous studies have examined the impact of corruption on a country's capacity to draw foreign direct investment (FDI), but the findings have been conflicting (Habib & Zurawicki, 2002; Cuervo-Cazurra, 2008; Godinez & Liu, 2015; Ferreira et al., 2016). The most common defense is that corruption reduces the potential to attract FDI by raising uncertainty and FDI costs (Habib & Zurawicki, 2002; Voyer & Beamish, 2004; Egger & Winner, 2005). However, there is also the counterargument that corruption encourages foreign direct investment (FDI) by speeding up transactions and avoiding institutional inefficiencies (Cuervo-Cazurra, 2008). Although other writers have not established a connection between corruption and FDI, the advantages of avoiding ineffective institutions through corruption may outweigh increased costs and uncertainties.

The literature on the impact of corruption on FDI is extensive, but it has ignored two aspects. Identifying the type of corruption is important (exceptions can be found in Rodriguez et al., 2005; Cuervo-Cazurra, 2006; Ferreira et al., 2016), but it's also important to take into account the corruption distance between the home nation and the host country (Habib & Zurawicki, 2002; Godinez & Liu, 2015). Corruption is a measure of a nation's institutional strength and a sign of its capacity to draw foreign direct investment (Kinoshita & Campos, 2004; Egger & Winner, 2005; Wernick et al., 2009; Zeghni & Fabry, 2009). By lowering risks, uncertainty, and transaction costs, institutional environments with higher development levels and consequently lower levels of corruption may promote FDI (Ali et al., 2010; Chao & Kumar, 2010). Institutional deficiencies, such as a lack of oversight of legal processes (Jeong and Weiner, 2012) or an overburdened or ineffective bureaucracy (Cuervo-Cazurra, 2006), encourage the use of abuse of public authority to acquire personal benefits.

Multinational companies (MNEs) are less likely to be able to withstand societal constraints and make FDI in an international setting the more disparities there are in corruption levels (Habib & Zurawicki, 2002). However, several research have indicated that the influence of corruption on FDI differs depending on the distance and possibly the direction of corruption. For instance, Godinez and Liu (2015) discovered that MNEs based in nations with low levels of corruption are less accustomed to the official and informal institutions connected to corruption, which causes them to perceive more risk and uncertainty in FDI. However, businesses based in high-corruption nations are not deterred by high levels of corruption in their host nations.

In other words, it's possible that MNEs from low-corruption nations may find it challenging to comprehend the standards and values of the market in which they

intend to operate as well as the organizational legitimacy they should get while dealing with corruption. However, MNEs from high-corruption nations might have a different perspective since they may have learned how to combat corruption in their home nations (Godinez & Liu, 2015; Ferreira et al., 2016). The face of institutionally underdeveloped ecosystems is corruption. The performance of businesses is negatively impacted by corruption (Doh et al., 2003; Uhlenbruck et al., 2006; Cuervo-Cazurra, 2008). It could be a result of institutional shortcomings (Ferreira et al., 2016). A common illustration of how institutional deficiencies lead to corruption is a weakness in the legal systems' ability to monitor laws, ensure that they are followed, and punish offenders (Karnani, 2007). Corruption is encouraged by a deficient institutional framework and a lack of oversight (Jeong & Weiner, 2012). By formalizing the costs of corruption in the form of fines and legal processes (Galang, 2012), sophisticated legal and political institutions, on the other hand, operate as barriers to corruption. Therefore, the presence of institutional gaps and inefficiencies deters corporations from investing, whereas institutionally competent frameworks make it possible to attract MNEs and investments.

Despite much research on the topic, the impact of corruption on economic data has not yet been fully examined due to its multifaceted and complex nature. The literature continues to have two distinct stances on how corruption affects an economy. They are represented by the economic growth wheel, in which corruption may serve as the "grease" or "sand" (Méon & Sekkat, 2005). This idea demonstrates that corruption may have a favourable or unfavourable effect on economic growth, and it ignores ethical considerations in favour of focusing solely on the economic components of this phenomenon. This study examines the notion that corruption might have both

beneficial and bad effects on an economy at the same time. Consequently, it helps start a new thread.

From the point of view of cost and income analysis in an enterprise, it may turn out that paying a bribe is beneficial to the company's finances. The cost of corruption might be seen as an expense that may reduce transaction costs (Cuervo-Cazurra, 2016). This alternative approach to the costs of corruption occurs when paying a bribe reduces the time needed to get a permit for business activity, so the fixed costs of running a company are decreased. Therefore, the sooner the business activity is started, the sooner the income will be generated. Innovation is treated as a significant factor of economic growth. Innovative investments contribute to a dynamic increase in the size and quality of human capital (Pastusiak, 2012), and this also indirectly contributes to increasing economic growth. Corruption affects the condition of the entire economy, and thus it also affects its innovation. Shera and others point out that "corruption tends to damage innovation activities" (Shera, Dosti, & Grabova, 2014).

The sluggishness of officials who deliberately prolong procedures to get a bribe discourages entrepreneurs from undertaking innovative activities (Lau,Yang, Zhang, & Leung, 2015). In a corrupt environment, officials are not trustworthy, which also hinders innovation (Anokhin & Schulze, 2009). Lau and others noticed that companies with advanced technologies transfer their innovations from developed countries to developing countries through foreign direct investment. Corruption may discourage foreign investors from taking action in a country, which also hinders the flow of innovation. The positive impact of corruption on the level of innovation may be found only with imperfections in an economy exhibited, for example, by excessive bureaucracy, which corruption may prevent. That is, corruption may be a remedy for a larger "disease" in an economy

The impact of government expenditure on economic growth is always of the top concern in many countries. In particular, corruption control can play a very important role in stimulating the impact of government expenditures on economic growth (d'Agostino et al., 2016; Hodge et al., 2011). If this role is identified, countries will have a basis to make appropriate policies towards improving EG in a sustainable manner. In order to provide empirical evidence on this issue, we conducted this study with the objective of examining the role of corruption in the impact of on EG. The impact of government expenditures on economic growth be explained through the endogenous growth model (Bucci et al., 2021; Butkiewicz and Yanikkaya, 2011). Accordingly, government expenditures plays an important role in allocating resources in the economy, thereby impacting EG significantly in the long run. The impact of corruption on economic growth has also been confirmed in many empirical studies.

However, there are still some conflicting views on the level of this impact. Indeed, corruption can improve the efficiency of resource allocation in the economy, encouraging new investment, thereby stimulating EG (Aidt et al., 2008; Al Qudah et al., 2020; Banerjee et al., 2022; Blackburn et al., 2006; Gründler and Potrafke, 2019; Malanski and Povoa, 2021 and Saleh et al., 2016; Ugur, 2014). Nevertheless, control can have a negative impact on economic growth because it can restrict resource allocation in the economy. Accordingly, corruption can be useful in "greasing of the wheels", thereby promoting economic growth which proves to be suitable for countries with weak institutional quality. This view is supported by the empirical studies of Kato and Sato (2015), Huang (2016). In addition, some experimental studies have confirmed the nonlinear impact of corruption on economic growth, which means there is a threshold value of corruption in this impact.

Accordingly, corruption can stimulate economic growth significantly when corruption exceeds the threshold value (Aidt, 2009; Alfada, 2019; Dzhumashev, 2014; Haque and Kneller, 2009). From a different perspective, several empirical studies have assumed that corruption can reduce the efficiency of government expenditures use (Dzhumashev, 2014; Keefer and Knack, 2007), thereby having a significant impact on economic growth. In other words, corruption control may play an important role in the impact of economic growth. Indeed, Hodge et al. (2011) stated that corruption can promote economic growth by reducing government expenditures in 81 countries. It can be seen that Hodge et al. (2011) is one of the pioneering studies in exploring the role of corruption control in the impact of government expenditures on economic growth However, this study only made a statement about this role, and it has not analyzed the specific impact of government expenditures on economic growth at different levels of corruption control. In another study, d'Agostino et al. (2016) noted that corruption is closely associated with government expenditures in 106 countries. Accordingly, corruption and government expenditures are two factors that have a negative impact on economic growth, but good corruption control can reduce the level of the negative impact of government expenditures on economic growth. Recently, Nan (2022) suggested that countries should improve corruption control as well as allocate government expenditures effectively to promote economic growth. It can be seen that the role of corruption control in the impact of government expenditures on economic growth is a research topic that has not been paid enough attention in empirical studies. Specifically, d'Agostino et al. (2016) and Nan (2022) are two rare empirical proofs to be in favour of the original statement of Hodge et al. (2011).

Notwithstanding, these experimental studies still have a great limitation when they only come to the conclusion that corruption control can interact with government

expenditures when these two factors affect EG. These studies have not analyzed the specific impact of government expenditures on EG at different levels of corruption control. This is really a big gap that needs to be explored and analyzed more adequately. In general, the impact of government expenditures on EG depends on the size of GE (Hajamini and Falahi, 2018) and especially the level of corruption control (d'Agostino et al., 2016; Hodge et al., 2011). It can be said that the size of government expenditures and the level of CC are two important factors for many countries when these countries desire to achieve sustainable EG (Alfada, 2019; d'Agostino et al., 2016). Corruption can stimulate government expenditures (Haque and Kneller, 2009), because it enables bureaucrats to abuse their public positions for private gains (Dzhumashev, 2014). If government expenditures is used effectively, it can boost EG, otherwise it can inhibit EG (d'Agostino et al., 2016; Montinola and Jackman, 2002).

This shows that government expenditures and corruption control can interact with each other and this interaction can have a significant impact on EG. This judgment was found in the studies conducted by Hodge et al. (2011), d'Agostino et al. (2016) and Nan (2022). It can be seen that these are groundbreaking studies which find a significant impact of the interaction variable between government expenditures and corruption control on EG. However, this issue has rarely been examined in empirical studies. In addition, there is a lack of empirical studies examining the specific impact of government expenditures on EG at different levels of corruption control. Accordingly, we can determine the existence of threshold values of corruption control in this impact. Especially, the impact of government expenditures on EG in the regions before and after these threshold values is examined, which has not been done

in previous studies. Accordingly, the improvement in corruption control becomes very important for EMDEs in Asia in promoting sustainable EG.

Furthermore, these countries need to allocate government expenditures reasonably and efficiently. On top of that, the synchronous combination of many appropriate policies is also essential in promoting sustainable EG. The rest of the study is organized as follows. The next section presents an overview of the relevant literature, followed by the methodology and data section. Section four reports the main empirical results, and section five of the article draws conclusions and proposes a number of policy implications for improving the effectiveness of government expenditures on EG The neoclassical growth model and the endogenous growth model are two important models in the theory of EG (Bucci et al., 2021; Butkiewicz and Yanikkaya, 2011). In the neoclassical growth model, EG depends on the growth of resources (labor) and technology. This shows that EG is not impacted by the government's policy selection. In the endogenous growth model, this model assumes that policies and other variables influence EG in the long run. In these policies, government expenditures plays an important role in resource allocation in the economy, and therefore, it can have a significant impact on EG. Moreover, government expenditures is also considered to be the main cause of EG in many countries (Loizides and Vamvoukas, 2005). government expenditures not only responds to the needs of the public sector, but also helps regulate the private sector (Arestis et al., 2021). As a result, the role of government expenditures in EG has been increasingly improved, especially in the case of the countries in the process of industrialization and urbanization. The economic theory asserts that government can influence EG through two ways: Positive impact through the effective provision of

public goods and services; Negative impact through ineffective provision of public goods and services (Grossman, 1990).

In empirical studies, although this is a topic that has been of great interest, there are still many contradictory views. government expenditures can boost EG through consumption stimulation and the incentive to promote private investment (Arestis et al., 2021). Indeed, increased and effectively used government expenditures can improve the quality of public services, stimulating domestic consumption, as well as also facilitating and promoting private sector investment. Therefore, government expenditures can have a positive impact on EG, which is what most countries desire to aim for. This result is also found in many empirical studies. corruption control can play an important role in stimulating EG because corruption is often considered an important obstacle to EG in many countries (d'Agostino et al., 2016). Indeed, corruption increases uncertainty in terms of return on investment (Blackburn et al., 2006; Guriev, 2004), reducing individuals' investment motives and, in particular, decreasing the effectiveness of resource allocation in the economy (d'Agostino et al., 2016).

In an environment of high corruption, the resources allocated in the economy will be wasted and ineffective (Cieslik and Goczek, 2018). Consequently, corruption can lead to discouraging new investment, destabilizing the economy, impeding EG and becoming a burden on each country (Blackburn et al., 2006; Pellegrini and Gerlagh, 2004; Rock and Bonnett, 2004). With an approach through the synthesis of the results of empirical studies, many researchers have declared that corruption can hinder EG. For example, Ugur (2014) synthesized the results of 29 empirical studies and found that although there are differences in the country scope, the analysis time and the estimation method, the main direction of the impact of corruption on EG is negative.

With the synthesis of the results of 41 empirical studies, Saleh et al. (2016) found that most of the empirical studies have a common view on the negative impact of corruption on EG. With another point of view, Aidt et al. (2008) claimed that the impact of corruption on EG in countries depends on the institutions of these countries. Specifically, in the countries with high institutional quality, corruption can have a significant negative impact on EG.

Meanwhile, in the countries with low institutional quality, the impact of corruption on EG is insignificant. Additionally, Cieslik and Goczek (2018) also found that corruption can hinder investment and inhibit EG in 142 countries. This study also found that rich countries often have easier access to international financial resources and are less susceptible to corruption than emerging economies. Moreover, corruption also causes significant costs to the economy, the resources in the economy are allocated inefficiently, and policies are distorted. In another study, Gründler and Potrafke (2019) found a negative impact of corruption on EG in the long run in 175 countries, and this impact was evident in the countries with low institutional quality. Al Qudah et al. (2020) also found a negative impact of corruption on EG in the long run in Tunisia. Sharing the same view, Malanski and Povoa (2021) found a negative impact of corruption on EG in emerging countries in Latin America and Pacific Asia. Meanwhile, Goel and Nelson (2021) stated that the effectiveness of CC in countries depends on the size and structure of the government.

Recently, Banerjee et al. (2022) have asserted that corruption control plays an important role in developing countries, especially in the improvement in the ability to mobilize capital in these countries. corruption control can have a negative impact on EG because it can limit the allocation of government resources, thereby inhibiting EG. This impact is appropriate for countries with poor institutional quality. Indeed,

Colombatto (2003) presumed that in developing countries, corruption acts as “speed money” under conditions of political instability and institutional inefficiency, thereby boosting EG. Therefore, corruption control scan hinder EG in these countries. Sharing the same view, Aidt et al. (2008) have claimed that corruption does little to detract from EG in countries with poor institutional quality. This view is also supported by the study of Kato and Sato (2015) with the analysis of the Indian data. In addition, Huang (2016) found a positive impact of corruption on EG in South Korea. The author also argued that the fact that policy makers use anti-corruption policies to promote EG may not be effective.

Since the 2000s, many empirical studies examining the determinants and the economic and political consequences of corruption in the public sector used Transparency International's Corruption Perception Index (CPI). The studies on corruption and economic growth by Méon and Sekkat, 2005, D'Agostino et al., 2016 and D'Agostino et al., 2016, Huang, 2016, Tsanana et al., 2016, and Cieślik and Goczek (2018) also employed the CPI. Studies using the CPI in panel data models ignored that the CPI was not comparable across countries and over time before 2012. In particular, including fixed period effects in panel data models does not solve the incomparability problem because the CPI in individual years before the year 2012 included data for different components and time periods to measure perceived corruption across continents. We believe that measuring corruption in the public sector by the CPI is suitable.

However, one cannot conclude from previous studies that corruption decreases growth, because the earlier version of the CPI is not comparable across time. Another important issue that many previous studies ignored is that economic growth may also influence corruption, because increasing living standards and incomes are often

accompanied by an increasing quality of political institutions. Empirical evidence shows that corruption in an individual country or region is positively correlated with corruption in neighboring countries or regions (e. g., Becker et al., 2009, Faber and Gerritse, 2012, Jetter and Parmeter, 2018, Borsky and Kalkschmied, 2019). Spatial dependence is a vigorous instrumental variable for corruption.

We employ the new CPI for 175 countries over the period 2012–2018 to re-examine the nexus between corruption and economic growth. Our study relates to new empirical growth models, which use annual dynamics in log real per capita GDP to examine determinants of economic growth (Acemoglu et al., 2019). The cumulative long-run effect of corruption on growth is that real per capita GDP decreased by around 17% when the reversed CPI increased by one standard deviation. The effect of corruption on economic growth is especially pronounced in autocracies and countries with low government effectiveness and rule of law. Corruption is also found to affect foreign direct investment and inflation, which suggest that those variables may be channels of transmission from corruption to growth.

If the government practices good governance, corruption is detrimental; in contrast, its impact is favorable when ineffective administration is practiced. According to the level of corruption, identify two separate regimes. The first regime has a high amount of corruption, which has the consequence of slowing growth. The second regime has modest levels of corruption, which actually promote growth. Aidt (2009) and Ali (2015) asserts that there are three stages of corruption, which can be categorized as pre-modern, modern, and post-modern, in a recent study. The causes and effects of corruption vary across stages, as do the actions aimed at reducing corruption. He suggests that the evolutionary process from the pre-modern to modern to post-modern

stages, allowing for an improvement in institutional quality and economic development, will result in an optimal level of corruption reduction.

Some empirical studies that look into the indirect impact of corruption through government spending have been driven by the conflicting results on the direct effects of corruption on economic growth. According to Dzhumashev (2009), while the indirect effect of corruption is proven to be statistically significant, many empirical research do not discover strong negative results about the direct influence of corruption. After accounting for the interplay between corruption and government spending in the estimations, he discovers that the direct effect of corruption might pose a risk to economic growth and becomes statistically significant. Ugur (2014) argues that the indirect consequences of corruption on public finances and human capital are likely to have a negative impact on economic development in low-income nations with ineffective bureaucratic circumstances. Corruption may also alter the composition of government spending and the collection of taxes. According to some academics, major projects like infrastructure and engineering are more likely to benefit from corruption than administrative areas like wages.

According to Keefer and Knack (2007), corruption alters the budget structure, which results in ineffective public spending and rent-seeking. Similar works support this opinion (Fisman and Gatti, 2002; Dzhumashev, 2013). According to d'Agostino et al. (2016), corruption has a negative impact on military and consumption spending; however, corruption in investment spending is likely to boost economic growth. According to a new study by Ali and Solarin (2019), which supports the important impact of corruption on military spending, nations with greater levels of corruption tend

When examining corruption in a particular nation, the choice of corruption metric does significant. Other anti-corruption strategies, like corruption convictions and cases related to corruption, have been proposed in a few studies. Individual state convictions and surveys of corruption perception were the two corruption measures that Goel and Nelson (2011) looked at in the US. Using both metrics, they discovered that increased judicial employment decreases corruption and that the number of corruption convictions rises as the state's population does. The majority of these studies center on corruption in the United States and make use of corruption convictions at various levels, including state corruption convictions, average annual federal public corruption convictions (Goel and Nelson, 2011), and federal corruption convictions (Glaeser and Saks, 2006).

Olken (2009) used two separate corruption measures to examine corruption on a number of road projects in Indonesian villages. In order to analyze the discrepancy between opinions and actual experience while taking into account the respondent's subjectivity, personal traits, and background, the second measure considers the perception of corruption among the villagers surrounding road projects. The first measure is the amount of missing expenditures from material purchased for the projects. A corruption-related criminal case, which is defined as the official number of cases involving violations of anti-corruption laws, is an alternative corruption metric used by Kato and Sato (2015). They show that in India's regulated manufacturing sectors, corruption encourages the gross value added per worker and the capital-to-labor ratio. This study made use of a comparable measurement.

A few studies have empirically identified the effect of corruption in Indonesia's provinces on economic growth. Henderson and Kuncoro (2004) find that the growing corruption problem at the provincial level is due to a lack of regulation in local

governments. Olken (2007) analyses a corruption perception survey administered to residents living near road projects. He examines the missing expenditures on road projects in Indonesia and finds that approximately eight percent of missing expenditures are due to corruption in the purchase of construction materials (Olken, 2009). Vial and Hanoteau (2010) elaborate the effects of plant-level corruption on output and productivity growth. They find that the corruption effects confirm the "grease the wheels" hypothesis. Suryadarma (2012) examines education spending on human resource development. He finds that education spending has a negligible impact on school enrollment in highly corrupt regions, and he concludes that an increase in education spending would not drive an improvement in human capital development in a highly corrupt region. Regarding the limited data available to observe corruption in Indonesia, none of the existing studies examine the growing number of corruption cases in Indonesia's provinces.

On the one hand, the quantity of corruption cases takes into account both the effectiveness of law enforcement and the extent of corruption. It also illustrates the strength of the leader's drive to fight corruption. On the other hand, it exposes the government's weakness in containing corruption. When formulating suggestions for corruption control policy, using corruption as a measure calls for caution. The presence of more corruption cases does not necessarily indicate that the corruption issue has gotten worse. The rise in state losses due to corruption is correlated with an increase in the number of cases, as is a reduction in the amount of output that should benefit the populace. We used the number of corruption cases to assess the impact of corruption on economic growth because the data on the amount of state losses are not available due to confidentiality concerns. This study stands out from other studies because it uses corruption cases to evaluate the corruption issues in Indonesia's

provinces. Therefore, we must take note of their nonlinear relationship in order to increase our understanding of how corruption affects economic growth at the provincial level. This study quantifies the level of corruption and demonstrates whether it hinders or promotes economic growth. We investigate the impact of corruption on economic growth at various corruption thresholds.

1.3 Common Market of Eastern and Southern Africa (COMESA)

The Common Market for Eastern and Southern Africa (COMESA) was established in 1994 with the goal of removing tariff and non-tariff obstacles to movement of goods and services among member nations in order to foster regional economic integration and growth. Burundi, Comoros, DRC, Djibouti, Egypt, Eritrea, Ethiopia, Eswatini, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Somalia, Sudan, Tunisia, Uganda, Zambia, and Zimbabwe are now members of COMESA.

COMESA members signed the Free Trade Area (FTA) agreement in 2000, with the goal of achieving sustainable growth, promoting joint development in all fields of economic activity, cooperating in the creation of an enabling environment for foreign, cross-border, and domestic investment, and promoting peace, security, and stability among member states in order to boost regional economic development (COMESA, 2013).

Many African banks engage in government assets, such as primary treasury bills, resulting in market overcapacity. In terms of credit to the private sector by the banking sector as a percentage of GDP, there has been a low level of financial development, leaving little money for loan to the private sector (Otchere et al., 2011). This research looked at the impact of investor protection, private sector lending,

foreign exchange rate, and the moderating effect of corruption perception on economic growth.

1.4 Problem Statement

COMESA was founded as an organization of free autonomous sovereign states that agreed to cooperate in exploiting their natural and human resources for the benefit of all of their people, and as such; it has a diverse set of goals, including promoting joint development in all fields of economic activity and the joint adoption of macroeconomic policies and programs to raise the standard of living of its peoples and to foster closer relations among its members states. COMESA's focus, however, is on the establishment of a major economic and trade unit that can overcome some of the limitations that individual states confront, due to its economic history and experience.

Mobilizing domestic financial resources, mobilizing foreign financial resources, and boosting international trade (exports) as a growth engine were all highlighted. However, it is unclear whether these measures will solve the COMESA countries' economic growth problems, and economic growth in these countries has remained a challenge for all economies. COMESA countries have a wide range of income per capita and diverse rates of economic growth; some expand quickly while others remain stagnant for lengthy periods of time.

The hope was that by gradually removing trade barriers among the COMESA member countries, trade in the region would improve because of increased competition and a larger market. Increased trade would eventually promote the member countries' economic growth and development. However, this has not been achieved despite the effort by member countries. According to Tumbwaze and Ijjo (2015) COMESA

countries has had a progressive regional interaction, the region's economic growth has not been impressive. For instance, in 2018 the rate of economic growth in COMESA region dropped to 4.7% as compared to 7.5% in 2017 (Ministers, 2020). In 2016, the region's economic growth was 4.7% down from 6.1% in 2015, which was a decrease of 0.5% as compared to 2014. This begs the question of why COMESA countries' economic growth varies so much. This is because the literature on the relationship between macroeconomic variables and economic growth is still debated. This nexus is further made uncertain by other factors such as investor protection, democratization, and corruption issues.

Furthermore, despite the fact that the relationship between macroeconomic variables and economic growth has been the subject of much research and empirical scrutiny in recent decades, empirical studies in COMESA countries are few and yield mixed results as to the nature and direction of the causal links between investor protection, private sector credit, corruption perception index, foreign exchange rate, and economic growth. Corruption increases the cost of doing business by up to 10% on average, according to the World Economic Forum (2019). The Corruption Perceptions Index ranks countries that score poorly on the World Bank's Doing Business Indicators. This means that excessively corrupt countries will have a hard time developing. According to the International Monetary Fund, investment in corrupt countries is around 5% lower than in moderately corrupt countries. According to the African Union, corruption costs Africa up to $15 billion every year.

The Corruption Perception Index (CPI) which has a score from 0-10 with countries which are more corrupt have an index close to zero and those which have low corruption cases have score close to 10. From the data about the CPI (2020), most of the COMESA countries have a score between 1.2 and 5. Countries such as South

Sudan, DRC, Burundi, Comoros, Zimbabwe, Uganda, and Kenya among others have CPI between 1.2 and 3.1 this prompt COMESA creating a Regional Model Code on Anti-Corruption Compliance to assist regional businesses in improving their business climate. The effort is part of the COMESA Business Council (CBC) Integrity Project, which is being carried out in collaboration with the Centre for International Private Enterprise (CIPE). The goal of this program is to strengthen the private sector's capacity to combat corruption and increase their engagement in transparency and reform activities, resulting in a good and enabling business climate. It's with this regard that the study intended to investigate the significance of corruption index by moderating the relation between the explanatory variables and the economic growth among COMESA states and try to answer why there are differences levels in economic growth among COMESA countries between 2000 to 2020 and why some countries grow rapidly while others stagnate for a long time.

1.5 General Objective

The general objective of the study was to analyze the determinants of economic growth among COMESA countries.

Specific Objectives of the Study

1. To establish the influence of credit to private sector on economic growth among COMESA Countries
2. To evaluate the effect of investor protection on economic growth among COMESA Countries
3. To investigate how foreign exchange rates affects economic growth in COMESA Countries

4. To establish whether corruption has a significant influence on economic growth among COMESA Countries.

5a. To find out the moderating role of corruption on the relationship between credit to private sector and economic growth among COMESA Countries

5b. To investigate the moderating role of corruption on the relationship between investor protection and economic growth among COMESA Countries

5c. To determine the moderating effect of corruption on the relationship between foreign exchange rate and economic growth in COMESA countries.

6. To establish the cointegrating relationship between credit to private sector, investor protection, foreign exchange rate and economic growth in COMESA countries

1.6 Hypotheses of the Study

The study tested the following hypotheses.

$\boldsymbol{H_{01}}$: Credit to private sector does not influences economic growth in COMESA Countries.

$\boldsymbol{H_{02}}$: Investor protection has no significant effect on economic growth among COMESA Countries.

$\boldsymbol{H_{03}}$: Foreign exchange rates do not have any effect on economic growth in COMESA Countries

$\boldsymbol{H_{04}}$: Corruption index has no significant influence on economic growth in COMESA Countries.

$\boldsymbol{H_{05a}}$: There is no moderating role of corruption on the relationship between credit to private sector and economic growth in COMESA countries.

$\boldsymbol{H_{05b}}$: Corruption does not have a significant moderating role on the relationship between investor protection and economic growth in COMESA countries.

$\boldsymbol{H_{05c}}$: Corruption does not moderate the relationship between foreign exchange rate and economic growth in COMESA countries.

$\boldsymbol{H_{06}}$: There is no cointegrating relationship between credit-to-private sector, investor protection, foreign exchange rate, corruption perception and economic growth in COMESA countries.

1.7 Significance of the Study

Economic growth has remained a challenging issue in all economies of the world. COMESA countries have large differences in income per capita and exhibit different rates of economic growth- others grow faster while others stagnate for a long time. This research intends to investigate why such scenario exist. The research generates new knowledge by analyzing the determinants of economic growth among COMESA countries. Macroeconomists, policy makers and central monetary authorities of all the nations need to know whether investor protection, credit to private sector, foreign exchange rate, and corruption perception understanding are beneficial to growth or detrimental to growth. The research also addresses this controversial issue.

The main aim of the study was concerned with the moderating role of corruption perception. It is of great significance. Many investors may not posses' adequate knowledge to take informed investment decisions. Some of them may not be aware of the complete risk-return profile of the different investment. This study tries to

understand how investors protection in countries in COMESA regions. It gives an insight and suggest ways in which the respective government protection their investors to spur economic growth.

The study further provides full understanding on the why some of the middle-income economies are prospering while others stagnant. This study adds to the existing literature in two ways: it adds to the literature on regional studies by providing a new perspective on the complexities of development issues at the subnational level.

1.8 Scope of the Study

The study aimed at analysing the influence of corruption, credit to private sector, investor protection, and foreign exchange rate on the economic growth of countries in COMESA trading bloc. COMESA has 21 member states at the moment. The study employed a cross-sectional statistical analysis for all nations that are members of COMESA that met the inclusion and exclusion-inclusion criteria. These are countries that have statistics and information for the 2000-2020 study periods.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This section of the research presents theoretical framework, empirical literature review that guides the study, and in the last section the conceptual framework that guided the study based on the variables is also presented.

2.2 Conceptual Discussion

This section describes the various concepts about the variables being studied. It entails concept on economic growth, investor protection, credit to private sector, foreign exchange rate and the concept of corruption index. Each of them is described in subsection below.

2.2.1 Concept of Economic Growth

Development, modernization, westernization, and industrialization have all been used interchangeably to describe economic expansion. In other words, it signifies a shift from a low-income, simple economy to a high-income, contemporary economy (Haller, 2012). Economic growth refers to the method and policies that a country uses to increase the economic, political, and social well-being of its citizens (Aron, 2010). Economic growth is defined by Mankiw (2014) as an increase in real GDP (gross domestic product) or real GNP (gross national product).

Even though economic growth is commonly measured in terms of GDP growth, it is more commonly defined in terms of per capita income growth and attainment of a standard of living comparable to that of developed countries. As a result, economic growth implies an improvement in a wide range of developmental indicators such as literacy rates, life expectancy, and poverty rates (World Bank, 2012). Additionally,

economists define growth as the expansion or contraction of an economy's business cycle over a lengthy period of time (Mankiw, 2014; D'Alisa, Demaria, & Kallis, 2014). Thus, economic growth can be either positive or negative whether measured as a change in per capita gross domestic product (GDP) or another measure of aggregate income (Haller, 2012).

GDP has been and continues to be one of the most extensively used metrics of a country's economic success, according to the literature on economic growth. Similarly, Sabillion (2017) defined economic growth as an increase in the number of products and services produced in an economy over a set period of time, usually a year. Economic growth has been so slow since the dawn of human history that it has been non-existent in most countries, according to the author. Since its establishment, GDP has been widely employed to quantify economic growth, as seen by the accompanying statements. GDP is thus regarded as a measure of market activity, but it is also extensively employed as a barometer of living standards. However, using GDP as a measure of a country's wealth and growth has a number of drawbacks that make it less effective as a gauge of a country's economic performance, and especially as a gauge of its society's standard of living.

Because of the world economy's strong performance between 2004 and 2007, many people were caught off guard by the global economic crisis. The financial industry's short-term gains, rising debt levels, and the real estate bubble all led to a false picture of underlying economic conditions at this time. This shows that our current measuring system is defective, and that actions should be taken to enhance GDP as a measure of economic and social growth (Stiligitz, Sen & Fitoussi, 2010). Despite its shortcomings, GDP is difficult to replace because it provides a single summarized figure that can be compared across countries. Credit availability, according to Khamis

and Klossifov (2009), permits businesses to make investments that they would not have done otherwise. They also demonstrate the macroeconomic impact of greater credit availability: as loan availability rises, so does consumption and investment demand, resulting in increased output and employment.

2.2.2 Concept of Investor Protection

Investor protection is a broad word that refers to a number of policies aimed to protect investors from corporations, merchant bankers, depository participants, and other middlemen who perform poorly. The term "investor protection" refers to a process or mechanism that safeguards an investor's interests in the securities market. Essentially, it refers to the actions taken with the goal of bringing and maintaining transparency in procedural aspects when dealing with investors through some regulatory bodies and appropriate legislation. According to Chu *et al*., (2017), local governments should take actions to strengthen investor protection if they wish to improve local financial growth, which is a crucial driver of local economic development. Government meddling in contracts and private property has a major impact on economic growth.

The relationship between investor protection and economic growth, according to Castro *et al*. (2004), is based on two conflicting effects. On the one hand, improved risk sharing results from increased investor protection, meaning a stronger demand for money. The favorable association between investor protection and growth is bolstered by this "demand" effect. On the other hand, the "supply" effect works in the other direction. Because of the shift in demand, more investor protection implies higher interest rates. A higher interest rate indicates reduced income for businesses, especially the younger generation, resulting in a high in capital supply in the future.

2.2.3 Concept of Credit to Private Sector

The rate at which one currency is exchanged for another is known as an exchange rate. Currencies are usually national currencies, although they can also be sub-national, as in Hong Kong, or supra-national, as in the euro. An exchange rate is the rate at which one currency is exchanged for another. Financial corporation's give financial resources to the private sector in the form of loans, non-equity securities purchases, trade credits, and other accounts receivable, all of which establish a claim for recovery. Some countries' claims involve credit to public enterprises. Among the financial corporations are monetary authorities and deposit money institutions, as well as other financial corporations for whom data is accessible (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Private sector lending is an engine of economic growth in many economies because it efficiently allocates resources for investment (Kiriga, Chacha & Omanyo, 2020; Nzomoi, Were, & Rutto, 2012).

According to Spratt (2013), private sector expansion benefits emerging countries up to a point where the private sector loan to GDP ratio reaches 80%, after which continued development of the sector becomes detrimental due to greater resource misallocation and instability. Griffith-Jones et al. (2014) bolster this argument by stating that rapid finance sector growth can negatively impact growth and output volatility. Credit availability, according to Khamis and Klossifov (2009), permits businesses to make investments that they would not have done otherwise. They also demonstrate the macroeconomic impact of greater credit availability: as loan availability rises, so does consumption and investment demand, resulting in increased output and employment. According to Lawrence (2011), there is a strong positive relationship between private sector credit and economic growth during the last two

decades, with nations reporting a greater private sector to GDP ratio performing better in terms of economic growth.

2.2.4 Concept of Foreign Exchange Rate

The classic perspective holds that the foreign exchange rate and economic growth have a positive relationship. Because a rise in foreign currency rates increases net export volume and, as a result, economic growth due to increased total demand. Structural economists, on the other hand, believe that the exchange rate and economic growth are mutually exclusive. Because the input structure of production in developing nations is based on imported capital and intermediate goods, an increase in exchange rates makes import manufacturing inputs more expensive, reducing economic growth (Karahan, 2020).

Exchange rate fluctuations' economic repercussions are one of the most contested topics in the literature. In recent decades, one of the most prominent research areas has been the impact of exchange rate changes on economic growth. Experts believe that changes in exchange rates and economic growth have a beneficial association. As a result, depreciation of the local currency following a rise in the exchange rate increases exports while decreases imports by changing the relative prices of domestic and foreign commodities. Chen (2012) looked at the function of the exchange rate in economic growth and the convergence of growth rates in Chinese provinces, and found that an increase in the real exchange rate boosted provincial economies. Aman et al. (2013) investigated the relationship between the exchange rate and economic growth in Pakistan using three stage least square approaches.

To put it another way, the depreciation of the local currency both converts and directs foreign demand into the country. Exchange rate hikes promote economic growth by

boosting net exports. As a result, devaluation might be offered as a viable policy instrument for stimulating economic growth. Structuralism economists, on the other hand, say that the devaluation program will harm emerging countries' economies. Because the concept of foreign dependency is one of the most serious structural concerns in emerging countries' economies. Imports provide the majority of the inputs needed by such countries, particularly in their manufacturing operations.

Imports provide the majority of the inputs needed by such countries, particularly in their manufacturing operations. As a result, fluctuations in the exchange rate will increase the cost of imported inputs like machinery and intermediate items utilized in the manufacturing process. As a result, rising production costs as a result of the home currency's depreciation can have a negative impact on economic growth. They showed that the exchange rate has a positive impact on economic growth by promoting export and import replacement industries. The impact of currency rates on Nigerian economic growth was explored by Obansa *et al*. (2013). The exchange rate has a strong favorable impact on economic growth, according to the research. The exchange rate has a strong favorable impact on economic growth, according to the research. As a result, there is evidence that real exchange rate depreciation is significantly linked to economic growth.

2.2.5 Concept of Corruption

Corruption is a multifaceted phenomenon with many sources and effects, manifesting itself in a variety of structures and functions in a variety of circumstances. Corruption can range from a single illicit payment to an endemic political and economic system dysfunction. Corruption has been considered as a political or economic structural problem, as well as a cultural and human moral issue. As a result, definitions of corruption vary widely, from broad phrases like "misuse of public power" and "moral

degeneration" to narrow legal definitions like "bribery involving a public worker and a tangible resource transfer" (Andvig *et al*., 2000).

Corruption can be recorded or quantified in a variety of ways; the following are some indicators that can be used to capture the corruption perception index (CPI). Bribery, diversion of public funds, the prevalence of officials using public office for private gain without facing consequences, governments' ability to contain corruption and enforce effective integrity mechanisms in the public sector, red tape and excessive bureaucratic burden, which may increase opportunities for corruption, meritocratic versus nepotistic civil service appointments, effective criminal prosecution for corrupt officials, and adequate law enforcement.

Corruption is also heavily influenced by the low salaries of public administration employees (state officials), who are attempting to improve their financial position by accepting bribes; as a result, the socioeconomic situation of government officials influences the phenomenon of corruption. Allen, Qian and Shen (2018) discovered that corruption arises because agencies, institutions, and the government can no longer effectively control corruption due to underpaid officials, which is a problem particularly in developing countries, where there is insufficient tax revenue to properly reward local officials.

Corruption is also influenced by the poor pay of public administration employees (state officials), who try to improve their financial status by accepting bribes; as a result, the socioeconomic situation of government officials has an impact on the phenomena of corruption. According to Allen, Qian, and Shen (2018), corruption occurs when agencies, institutions, and the government are unable to effectively

manage corruption due to underpaid officials, which is an issue in developing nations when tax revenue is insufficient to fairly reward local authorities.

Countries with high levels of corruption struggle to function properly and thrive economically, causing widespread suffering. In a corrupt economy, resources are inefficiently dispersed, and bribery or kickbacks are routinely used to give government contracts to companies that would not otherwise be qualified. A corrupt economy degrades the quality of education and healthcare, resulting in a lower living level for the country's citizens. Corruption is one of the obstacles to international investment. Although investing in emerging economies is still popular, investors are understandably leery about putting their money at risk in countries where corruption is rampant.

2.3 Theoretical Framework

2.3.1 Rostow Stages of Development

According to the Rostow phases theory, different countries are at different stages of development, each with its own set of features. The stages of economic development are divided into five groups by Rostow: traditional culture, take-off preconditioning; take-off; drive to maturity or sustaining stage; large-scale mass consumption stage traditional society is characterized by subsistence (defined as no economic surplus, implying that output is consumed by producers rather than traded); barter trade (i.e., goods are exchanged directly for other goods); agriculture as the most important industry; and labor-intensive production with limited capital.

Increased specialization begins to provide surpluses for trading in the transitional stage (the preconditions for takeoff). A transportation infrastructure to support trade is also emerging. External trade occurs as well, with a focus on primary products, and a

new entrepreneurial class emerges to boost trade. Savings and investment rise as a result of greater trade.

Rapid industrialization or the industrial revolution characterizes the take off stage, with growth concentrated in a few parts of the country and one or two manufacturing industries. The amount of money invested exceeds 10% of GDP. The evolution of new political and social institutions that facilitate industrialization is accompanied with economic shifts. Growth is self-sustaining: increased investment leads to higher incomes, which generates more savings to fund more investment.

The following are characteristics of the drive to maturity stage: industrial diversification; production of a diverse variety of goods and services; export and import reliance may begin to decline; high consumption of mass; domestic aggregate demand is the most important factor of business (cycles); consumer durable industries and the service sector emerge as the most important (Jinghan, 2003).

Rostow's theory is analytically rich and helps understanding of economic development from multiple perspectives, despite the fact that it is placed at the national level. Such categories can also highlight a country's weakest spots and give information on its various stages of growth. For instance, a state that has been identified as being in the pre-takeoff stage based on numerous economic development indicators may need to increase its investment in certain sectors before taking off (Arora, 2009). This study aimed to categorize States into distinct phases of economic growth using Rostow's stages theory. The study shows how economic integration or globalization at the national level can differ dramatically at the regional level, using Rostow's multi-level phases hypothesis at the subnational level.

The Rostow model is based on American and European history, and it describes the American standard of high mass consumption as an essential component of all industrialized civilizations' economic progress. The model implies that Neoliberal trade policies will be unavoidably adopted, allowing the manufacturing base of a particular advanced state to be transferred to lower-wage locations. However, by the time it reaches maturity, Kuznets says that no growth can be automatic; a push is always required.

The model downplays differences between sectors in capitalism and communist countries, but it appears to realize that various types of economies can modernize in different ways. Another criticism of Rostow's work is that it only takes into account huge countries with a high population, natural resources available at the correct point in history, or a large land mass. Rostows has little to say and, more importantly, he gives little hope to small countries lacking such advantages. According to Rostow, liberal economic theory gives much of the globe hope that economic maturity is approaching and that the age of mass consumption is approaching.

2.3.2 Solow’s Classic Model

Solow's classic model is a fantastic piece of work that encompasses all aspects of a theory. It addresses the most pressing issues, such as what affects living standards and why some countries are wealthy while others are impoverished. The argument is built on common assumptions, but it leads to unexpected conclusions. All genuine empirical investigations of growth and productivity begin with Solow's model (Romer, 2012). The Solow model emphasizes technical progress, namely productivity increase, as the key to long-term per capita income and output growth. Capital accumulation only leads to long-term growth when it is combined with improving technologies. The Harrod-Domar Model, which emphasized the importance of saving,

investment, and capital accumulation, was expanded by the Solow model. By incorporating labor, money, and technology, it codified and expanded the Harrod Model. The residual component is thought to be explained by technology, which previously thought to be determined exogenously.

One of the most researched problems in the study of growth models is the asymptotic stability of equilibrium growth. Some argue that growth models have been extensively researched because they are theoretically and practically important (Accinelli and Brida, 2007; Emmenegger and Stamova, 2002; Fanti and Manfredi, 2003; Ferrara, 2011). The indigenization of the capital labor ratio, which varies depending on the level of capital per worker and the characteristics of the production function, is one of the model's advantages. As a result, this model adds the technological idea of economic growth and explains a small amount of the growth variance. For example, falling returns on capital per labor in economies, despite the fact that this concept is rarely assessed in the real world and, when estimated, is mostly explained by other variables.

The model's limitations are based on assumptions such as exogenous technological advancement. However, this is contingent on, among other things, investment decisions in education, research and development, and innovation. As a result, in the convergence study, the model assumes that all countries have the same technology. It ignores internal elements (educational capacities and ability to absorb imported innovations, as well as the local level), which nations use to achieve distinct technological advancements. In addition, this model misses important elements that are mentioned in other growth models. It ignores essential growth variables like human capital, international trade, social capital, and so on, for example, although

following endogenous growth theories. It's vital to emphasize that all of this modeling is based on neoclassical models.

2.3.3 The Cognitive Psychological Theory of Corruption

According to cognitive psychology, to understand individual decision-making processes (including decisions to engage in corrupt behavior), it is a must to examine elements that impact information processing such as time, mental capacity, and motivation. Further, it is good to investigate how people cognitively process and organize information utilizing cognitive structures, the relevance of emotions, and the significance of social context. Theory of cognitive psychology of corruption explains how psychological influence of power, personal gain and self-control, loss aversion and risk acceptance, rationalization, and emotion on the propensity to act corruptly. According to political psychologist Jon Mercer (2005), the theory explains people make decisions to achieve a goal based on how one should think, not how one really reason. Human beings are susceptible to a variety of cognitive biases that shape their decision-making and behavior in ways that do not conform to the predictions of rational choice and functionalist approaches (Daniel Kahneman (2011).

In the academic study of corruption, anti-corruption practice and policy approaches. Cognitive psychology theory on corruption explains corruption as the function of calculating, strategic, self-interested behavior and corruption is particularly likely to occur in situations of power asymmetry, where some individuals hold power over others. The theory is relevant to the study as it mitigates these cognitive influences; support measures that improve information flows about the costs of corruption; reward ethical behavior and set basic integrity standards, and; that improve organizational decision-making. Psychology of corruption focuses primarily on the

social psychological determinants of unethical behavior, such as the influence of group norms, interactions, and dynamics.

2.3.4 Purchasing Power Parity Theory

Purchasing-power-parity theory postulated by Gustav Cassel in 1918 is a two-proposition operational theory. The first is that, under a flexible exchange-rate standard, monetary considerations are the most significant long-run determinants of the exchange rate. The second is that, aside from random deviations, the remaining drivers of the exchange rate under a flexible exchange-rate standard are tariffs and trade barriers, transportation costs, capital flows, and expectations. Cassel developed this idea so that it could be applied to both a flexible exchange-rate standard and the gold standard. In this more comprehensive formulation, the major drivers of a country's domestic products price were monetary considerations, while the secondary drivers were tariffs and trade barriers, transportation costs, capital flows, and expectations. In the literature, there are two alternative interpretations of purchasing-power-parity.

The first interpretation holds those changes in monetary factors, as measured by some index of prices in one nation compared to another, are the primary drivers of any significant exchange rate. The second interpretation holds those monetary factors in two nations, as measured by a ratio of some pair of price indexes in each nation, precisely determine the exchange rate. Given regular trade freedom between two nations, a rate of exchange will establish itself between them, and this rate, for the most part, will remain unaltered as long as no changes are made in the purchasing power of either currency or no particular restrictions are put on trade.

2.4 Empirical Literature Review

2.4.1 Relationship between Investor Protection and Economic Growth

Kriese and Agbloyor (2019) examined the relationship between financial consumer protection and economic growth. To achieve the objectives, the study employed the cross-country data from 114 nations surveyed in the World Bank global survey on financial investor protection and financial literacy. The study also used the endogenous method of regression analysis. The results showed that financial consumer protection promotes the growth of the economy through even development, responsible lending, enforcement and dispute resolution and recourse regulations. Lucas (1988) found out that there was no causal relationship between macroeconomic variables and economic growth. However, this hypothesis point was applicable only under the neo-classical assumption of no transaction costs and perfect information (Graff, 2000, as cited in Fink, *et al.,* 2006). Abala (2014) looked into the primary determinants of real GDP growth as well as the ones that drive foreign direct investment in Kenya. Foreign direct investment is widely acknowledged to have potential benefits for host countries. Kenya has had a dismal track record in attracting FDI since the 1980s, despite being a popular destination in the 1970s. The findings of the study demonstrate that foreign direct investments in Kenya are primarily market-driven, requiring rising GDPs, political stability and adequate infrastructure, market size, and lower levels of corruption. FDI inflow would be hampered by the presence of crime and insecurity.

Some economists, on the other hand, are suspicious, believing that there is little correlation between macroeconomic conditions and economic growth. Beakaert and Harvey (1997a) in a study stated that the viewpoint was unsurprising and offered some plausible reasons, highlighting the apparent fallacy in the viewpoint. The main

cause for suspicion was the information asymmetry that existed between a company's investors and its managers. Managers, on average, have far more information about a company's success than investors. When the firm's equity is mispriced on the stock market, managers have a better idea. As a result, managers only issue fresh equity when the company's stock is overvalued. As a result, investors are hesitant to invest in new stocks. Naturally, this explains why many businesses do not use additional shares to fund their investments. In a study of investor protection and economic growth in 170 countries, Haidar (2009) discovered that the level of investor protection mattered for cross-country disparities in GDP growth: nations with higher protections grow faster than those with less safeguards.

Chu *et al.,* (2017) conducted a study on the relationship between investor protection, government behavior, and financial development using data that was gathered from six provinces in China for a period of 9 years. The study used the panel data estimation methods and showed a positive relationship between investor protection and financial development; by contrast, highly intense government intervention leads to more financial impediments. Furthermore, government intervention in education could stimulate financial development through its contribution to having a higher amount of the fund supply.

Odongo (2012) conducted a study in Uganda on foreign direct investment and economic growth. The study used the time series data covering time period from 1970 to 2010. The main objective of the study was to analyze the determinants of FDI inflows in Uganda. The study employed the granger causality, variance decomposition and impulse response function method. The study found that international capital flows are particularly important in accelerating economic growth in Uganda. In addition, the study findings found that the determinants of inflows of

foreign direct investment are domestic investments, growth in Gross Domestic product, growth in exports and imports.

Porta *et al.,* (1999) did investigated the effect of on investor protection across countries on economic. The issue of concern was the difference in investor protection and economic growth. The study suggested that there is a mutual element to the explanations of these differences, namely how well investors, both shareholders and creditors, are protected by law from expropriation by the managers and controlling shareholders of firms. The study described the variances in laws and the efficiency of their implementation across countries and argued that the legal method is a more productive way to comprehend corporate governance and its reform than the conventional distinction between bank-centered and market-centered financial systems.

Catro *et al.,* (2004) conducted a cross country (South Korea and India) study with an aim of investigating whether investor protection has an impact on economic growth. According to the study, protecting investors means sharing of risk that might arise and negatively affect their investment. The standard overlapping generation model of capital accumulation was used. The findings of the demand effect showed that better protection causes an increase in interest rate and decreases the income of the investors, lowering current savings and thus cutting the supplies for the next period. The supply effect is stronger the tighter are the limitations on capital flows. The study model therefore predicted that the positive effect of investor protection on growth is stronger for countries with lower restrictions.

Geller (2003) investigated how different levels of investor protection and how legal origins have affected the stock market development in developing and developed

economies in the period between 2003 and 2007. The study findings showed that investors protection influence the depth of financial markets and revealed that the relation has worked differently in emerging economies in comparison to developed countries under the investigation.

2.4.2 Relationship between Credit to Private Sector and Economic Growth

The relationship between economic growth and credit to private sector has attracted attention among scholars in the recent past who have articulated empirical and theoretical studies on the relationship between economic growth and credit to private sector. Athanasios & Antonios (2010) investigated the relationship between economic growth and credit market in Italy for the period 1965-2007 by applying vector error correction model. The long-run relationship between bank lending, gross domestic product and inflation rate existed in application of Johansen cointegration analysis. Results showed that the error correction term is negative indicating that there is long-term relationship between economic growth and credit to private sector. It suggested there is a positive relationship between economic growth and credit to private sector. A one percent increase in credit to private was found to cause a 0.4 percent increase in economic growth. An increase in credit to private sector spurs economic growth. This is because investors are willing to invest in more risky venture while encouraging safe borrowers to be more effective.

Duican and Pop (2015) aimed at investigating implications of credit activity on economic growth in eight development regions of Romania for the period 2000-2014, namely Northeast, Southeast, South, Southwest, West, Northwest, Centre and Bucharest Ilfov. It was found out that credit to private sector has a positive influence on gross domestic product. The study concluded that it is important to a strong legal framework that would inject more funds toward innovative and profitable products in

economy and that the population should have adequate knowledge not only on the benefits of credit but also on risks associated with credits.

Armeanu *et al.*, (2015) in more recent study affirms that an increase in credit corresponds to increase in gross domestic product. These results were based on data obtained from the National Bank of Romania sites and from Eurostat for the period of 2007-2013, quarterly data, accumulating a total number of 28 observations. The author argued that in order to capture the effects of credit it was important to split gross domestic product into certain components using either expenditure or income method.

However, other research have been unable to demonstrate a beneficial association between private sector loans and output growth. For instance, Dey & Flaherty (2005) used a two-stage least squares regression model to assess the effect of bank credit and stock market liquidity on GDP growth and discovered that bank credit is not a reliable predictor of GDP growth. Based on causality tests, numerous research have likewise discovered comparable results. Using a Vector Autoregression (VAR) methodology, Shan and Jianhong (2006) investigated the effect of financial development on economic growth in China. They discovered that, after labor input, financial development is the second driver driving China's economic growth. Additionally, they discovered a two-way causal relationship between financial development and economic growth, which is comparable to the results for Greece from Hondroyiannis et al. (2005). Muhsin and Eric, however, discovered unidirectional causality, from expansion to the development of the financial industry. Mukhopadhyay and Pradhan (2010) used a multivariate VAR model to analyze the causal association between financial development and economic growth in seven developing Asian nations (Indonesia, Malaysia, the Philippines, China, Thailand, India, and Singapore). The

study was unable to come to a consensus regarding the relationship between finance and growth in the context of emerging nations.

Using a two-stage least squares method, Akpansung and Babalola (2012) investigated the relationship between credit provided by the banking sector and economic growth in Nigeria between 1970 and 2008. They discovered evidence showing that lending rates hindered economic growth during the sample period while private sector credit had a positive impact on it. Anthony (2012) discovered a favorable correlation between lagged values of total private savings, private sector credit, public sector credit, interest rate spread, exchange rates, and economic growth in a related study. According to Aliero et al., (2013) .'s study, which used the autoregressive distributed lag (ARDL) approach to explore the relationship between the private sector and economic growth in Nigeria, there is a long-term equilibrium relationship between private sector credit and economic growth. They discovered a significant connection between the pair and advised thorough regulations and a robust legal system to ease the issuance and recovery of private sector credit. Emecheta and Ibe (2014) used a VAR methodology to further confirm that bank credit has a favorable impact on economic growth.

Using the Gregory Hansen cointegration test, Olowofeso Adeleke and Udoji (2015) evaluated the effects of credit to the private sector on economic growth. The study took into account structural fractures and endogeneity concerns. The model was specified as a function of five independent variables, including credit to the private sector, yielding five covariates. Credit to the private sector, nominal exchange rate, prime lending rate, real gross domestic product, and gross fixed capital formation were among the factors studied. This study used quarterly data from 2000: Q1 to 2014: Q4, with the model coefficients estimated using the fully modified ordinary

least squares approach. The researchers discovered a cointegrating relationship between the independent variables and determinants. In Nigeria, the data revealed a strong link between private credit and economic growth. The study's findings also backed up the Central Bank of Nigeria's (CBN) attempts to promote a healthy and real-economy-friendly financial system, as well as a gradual drop in interest rates to boost economic growth.

Aliero *et al*., (2013) used autoregressive distributed lag to investigate the relationship between economic growth and lending to the private sector. It was determined that there is a long-term link between private credit and economic growth. They developed a good relationship. It advocated comprehensive regulations and a solid legal framework to make private sector credit disbursement and recovery easier. Emecheta and Ibe (2014) found similar results using a vector autoregressive technique, confirming that bank credit has a beneficial effect on economic growth (VAR).

Cappiello *et al*., (2010) used a panel technique for the euro region from 1999 Q1 to 2008 Q1, or since the European Monetary Union's founding. The article provided empirical evidence for the presence of a monetary policy transmission channel through bank lending in the euro area. It calculated the influence of loan growth on GDP and the effect of GDP growth on changes in credit criteria using two OLS regressions. Loan adjustments in credit conditions have a considerable impact on actual economic growth in the Eurozone, according to this report. It emphasizes the importance of credit monitoring as monetary policy, with credit analysis playing an essential part in monetary policy at the European Central Bank (ECB). It also highlights the negative consequences on economic growth that occurred in 2007 as a result of the financial crisis, which caused banks to reduce their loan supply. Driscoll

(2004) and Ashcraft (2006), on the other hand, found no convincing evidence for a substantial causal link between credit supply and output growth in the United States.

Piabuo & Puatwoe (2017). The study used the ARDL model technique to investigate the association between financial sector development and economic growth in Cameroon. The findings revealed that bank deposits, private investment, and economic growth all had a short-run negative association. However, over time, all financial development indicators demonstrate a favorable and considerable impact on economic growth. According to the study, those financial resources should be used toward financial reforms that promote financial sector development in order to stimulate economic growth. This was in line with the findings of Maureen Were (Corresponding author), Joseph Nzomoi, and Nelson Rutto, who used panel data from several sectors in Kenya to analyze the influence of private sector lending on economic performance. Their findings show a positive link between gross domestic product as measured by real value added.

Randveer Kulu & Uusküla (2011) used real GDP data for 20 emerging market countries to examine the impact of private debt on economic growth in OECD countries, and business cycles such as troughs and recessions were detected. Before and after the recessions, statistics on private debt, consumption, investment, and trade balances were collected. The analysis confirms that economic development and private credit have a favorable relationship in OECD nations.

Over the period 1985 to 2010, Mbate (2013) estimated a dynamic cross-country model and analyzed the impact of domestic debt on economic development and private sector lending in a panel of 21 Sub-Saharan African nations. The research was conducted using the generalized method of moments, and the results revealed a

nonlinear relationship between domestic debt and economic growth. Furthermore, domestic debt was discovered to negatively crowd out private sector financing, inhibiting capital accumulation and private sector growth. Using Kenyan sectoral panel data, Nzomoi and Rutto (2012) evaluated the impact of bank credit on the economic performance of important economic sectors. Credit has a favorable and considerable impact on sectoral gross domestic product as assessed by real value added, according to the study. However, after characteristics such as labor employed and prior economic performance of the sectors were taken into account, the magnitude of the impact was lessened.

2.4.3 Relationship between Corruption Index and Economic Growth

Corruption is said to be a complex phenomenon and it is understood to take various forms. The phenomenon of corruption ranges from a single act of an illegal payment to the endemic malfunction of a political and economic system. Corruption takes the form of either structural problem of political system, cultural, economics of cultural or individual phenomenon and its definition can be said to be misuse of public funds and resources and moral decay. Broadly, Andvig *et al.,* (2000) defined corruption as a misuse of public power and legally it defined corruption as the bribery involving public servant that involves the illegal transfer of public resources for personal gain.

Empirical literature by has shown that there is linear negative relationship between economic growth and corruption index. Based on panel data from developing countries for the period 1984 – 2009 while categorizing countries into: high income countries as developed countries and; the countries that are the low-income, lower-middle-income, and upper-middle income categories are developing countries Li *et al.,* (2000), Mauro (1995), Hall and Jones (1999), and Sachs and Warner (1997) and

Keefer and Knack (1995) showed that corruption is negatively associated with investment and economic growth. The authors further found that the causality is from corruption index to economic growth. Similarly, Shabbir & Anwar (2007) investigated the effect of corruption in developing and established that corruption has a negative relationship between corruption index and economic freedom. The study confirmed that increased economic freedom reduces corruption of a country. Alfada (2019) assessed the effect of corruption on economic growth by applying nonlinear to determine the intensity of corruption by analyzing the effect of corruption on economic growth for the period 2004 – 2015 in Indonesia. The study examined whether corruption is beneficial to economic growth. It concluded that corruption worsens economic growth process in Indonesian provinces if it exceeds certain threshold. Corruption threshold effect is assessed using a sample-splitting and threshold model developed by Hansen (2000), and the endogeneity issue is addressed using the instrumental variable two-stage least squares (2SLS) estimator.

Ahmad, Ullah & Arfeen (2012) in their study used panel data from the International Country Risk Guide, corruption index, institutional quality and political stability indices and several state variables for developed and developing countries to show the relation between corruption and economic growth using generalized method of moments. This study controlled for trade openness, the ration of government spending to GDP, risk of investment, gross growth, and lag of GDP per worker. The results indicated there is a negative linear relationship between economic and corruption index among countries. Similarly, Hoinaru *et al*., (2020) in their study entitled The Impact of Corruption and Shadow Economy on the Economic and Sustainable Development. Do They “Sand the Wheels” or “Grease the Wheels”? using a cross section of 185 countries showed that there is negative relationship between corruption

and economic growth. The study further corruption is a common phenomenon among low-income countries. Contrary the study also showed that corruption acts a way in which institution and individuals circumvent the laws to achieve to achieve economic benefits that will in turn lead to higher economic growth.

Méon & Weill (2010) in their study whether corruption as an efficient grease. Investigated whether corruption may be efficient tool in the grease the wheels of a deficient institutional framework. The study analyzed the interaction between aggregate efficiency and corruption using a sampled data from 69 countries both from the developed and developing. It was observed from the analysis that corruption has positive relationship with c economic growth in less developed while is showed a less detrimental effect in developing countries with weak government institution. Similar findings were found by Colombatto (2003) who found a positive relationship between economic growth and corruption accelerates the growth of the economy in the economy as it acts as speed for money in unfavorable economic conditions such as in time political instability in developing economies.

There is a spatial correlation between and within countries; corruption in one country has been proven to be positively connected with corruption in other countries (Becker et al. 2009, Faber and Gerritse 2012, Jetter and Parmeter 2018, Borsky and Kalkschmied 2019). For a variety of reasons, it is anticipated that corruption will positively correlate between neighboring nations. First, businesses frequently engage in trade and collaboration with counterparts in nearby nations. Corruption and other business practices are communicated between nations. Second, attitudes from surrounding societies are spread through migration. Third, political interaction between nearby nations is also likely to increase the likelihood of shared corruption

exposure. For instance, governments uphold shared borders, control trade internationally, and carry out common rules as handled by the European Union. Clearly, interrelations between firms, migration of citizens, and political exchange coincide and reinforce each other. For a more detailed discussion on how corruption is likely to transmit across neighboring countries see Borsky and Kalkschmied (2019).

There are two basic ways that corruption harms an economy: first, it affects the availability of physical resources, and second, it affects the availability of human capital. The increased costs of conducting business are the primary justification for the detrimental effects of corruption on an economy (O'Toole & Tarp, 2014). These expenses typically result from having to pay a bribe or add another position, which strains the budget and decreases the profitability of the business. When a corporation tries to conceal higher expenditures in its books, new costs become apparent. It must hire individuals with a specific set of skills for this aim. Corruption also makes doing business more dangerous since if this crime is exposed. The increased uncertainty of receiving a return is caused by the increasing costs of running company, which also lowers investors' expectations of a rate of return. Another effect of paying for corruption is the wasteful use of resources because money meant for bribes may instead be used to grow the business (Drury, Krieckhaus, & Lusztig, 2006). These expenses might include not just the cash resources used, but also the time that employees spent at work engaging in the full corruption process and its cover-up. As a result of corruption, both monetary capital and human capital will be less productive.

Mexico has continued to find methods to advance despite its elevated levels of corruption. Mexico's exports of goods is largely responsible for its economic prosperity. Mexico is the world's 12th-largest exporter, and 90% of its trade

agreements are covered by free trade agreements (Amadeo & Estevez, 2020). It seems that corruption in Mexico, particularly when it comes to trade agreements, does not obstruct progress as much as it does in other nations. The majority of the study's participating nations closely followed the trend line of the basic linear regression line. Given the high CPI score of Luxembourg, the conclusions of this study would suggest that they would have high growth levels.

This assumption is true, but why is Luxembourg's GDP per capita the largest amongst all other countries in this study? While reliable government processes and little corruption certainly contribute to the growth of Luxembourg, something else must be contributing to these large GDP per capita measurements. The notion that corruption can, under some circumstances, be advantageous for progress is perhaps the most unusual one. Typically, corruption is seen as a barrier to growth because of its dishonest and illegal nature (Al Qudah et. al, 2020; Mo, 2000; Fisman & Svensson, 2007, Aidt, 2009). Nathan Leff and others, on the other hand, have opposing views. According to American behavioral scientist Nathan Leff and his team, corruption "greases" the gears of an economy and fosters growth (Matthews, 2014; Bac & Bag, 2006). The main premise of this argument is that high-ranking officials' corrupt behavior has the ability to allow profitable trades that would not otherwise have occurred. Transactions and contracts may take a very long time to complete or may never be fulfilled in nations with poor infrastructures or unreliable governments.

Corrupt practices can actually increase efficiency by enabling members of the private sector to address or go around these limitations, which can "oil the wheels" and help governments overcome these shortcomings (Aidt, 2009). Peru is a prime example of how corruption aided development. Alberto Fujimori, the president of Peru, had a significant role in halting the rise of communism and bringing economic stability to

Peru in the 1990s. However, Fujimori did so by engaging in a number of unscrupulous practices (Olken & Pande, 2012). Fujimori made the decision to appoint a secret police head in order to bribe judges, lawmakers, and the news media as a result of inefficient markets and insecure government operations. This is an illustration of a dishonest practice called "speed money," where bribes act "like a piece rate or price discrimination and deliver faster or better service to the firms with the biggest opportunity cost of waiting" (Matthews, 2014).

Peru's GDP per capita increased by more than 10% from 2000 to 2010, the time of Fujimori's administration. Around 2% was the global average growth rate for GDP per person during that time. The corruption that occurred in Peru under Albert Fujimori's presidency appears to have contributed to the country's economy's expansion. More developed countries are not immune to corruption. The corruption that exists in advanced economies is often more subtle than that which exists in developing nations. In the United States, for instance, this is very evident. It is undeniable that people in positions of authority, even at the local level, exert a great deal of influence over national policy. The corruption that exists in American government is highlighted by a recent incident in Cincinnati, Ohio. As of November 2020, three Cincinnati city council members are facing corruption charges, and one of them has already entered a guilty plea (Levenson, 2020).

Despite their unscrupulous actions, these council members' acceptance of bribes is a superb illustration of how money can "oil the wheels" of political processes. Therefore, using corruption in the form of bribes to get around challenges faced by local governments makes sense. It is obvious that corruption has the capacity to spur economic growth after examining a number of corruption incidents. Corruption can assist businesses circumvent ineffective procedures and bypass rules, especially in

developing nations. Furthermore, in industrialized nations, "a little regulated wrongdoing can operate like a lubricant that makes it easier to move forward" . Corruption is without a doubt a dishonest and evil act. Corruption not only undermines a society's morality but also hinders a nation's development. As was already mentioned, it has been maintained that corruption has the potential to promote growth and more effective governmental procedures.

However, a more prevalent view on corruption is that it stunts development and destroys the national economy (Mo, 2000; Al Qudah et. al, 2020). Countries built on corrupt principles frequently disintegrate because of the threat that corruption poses to long-term sustainability (Aidt, 2009). By "greasing the wheels" of the economy, corruption might be able to temporarily alleviate some problems, but it is not something that a nation should turn to if it wants to maintain future prosperity. According to reports, corruption poses a variety of challenges to the expansion of an economy. Many studies back up this assertion. According to most academic research, corruption has a detrimental impact on growth rates (Mo, 2000; AlQudah et. al, 2016). For instance, economic and financial researchers determined that "corruption has a negative direct long-term effect on per capita GDP in Tunisia" in a detailed analysis of the country from 1995 to 2014. (Al Qudah et. al, 2020). Utilizing various Mauro used the most trustworthy indicator of economic growth, gross domestic product per capita, to ascertain how corruption influences the growth rates in these nations. Following that, a regression analysis of the GDP per capita and Bureaucratic Efficiency scores for these nations between 1980 and 1983 was conducted. The findings indicated that the study's correlation coefficient was 0.68. Typically, a strong, positive correlation is defined as any statistical investigation with a correlation coefficient above 0.50(Frost, 2020). In light of this, Mauro's research established that

the GDP per capita of a nation should increase as its Bureaucratic efficiency index score increases and vice versa.

Similarly, Aghion *et al.*, (2004); Blackburn *et al.*, (2006) and Mo (2001) Found that corruption has a negative effect on investment and brings economic uncertainty. Ola, Mohammed and Audi (2014) analyzed the main effects of corruption index in Nigeria. The study found out that corruption has a negative effect on economic growth in Nigeria as it devalues the quality of human life, robs country's institutions such as schools, hospital and agricultural sectors and welfare funds. And it concludes that the corrupt behavior must be punished.

Pulok (2010) studied the impact of corruption on economic development of Bangladesh based on the extended Solows model over long run relationship for the period 1984 -2008. In the study, the neoclassical model of economic growth by Solow (1956), human capital and public sector were included. The study utilized Auto-Regressive Distributed Lag (ARDL) Bounds Test method. The results of co-integration test confirmed that there is a long run relation among corruption, GDP per capita and other determinants of GDP over the study period. The study further established that the error correction term was negative and significant implying that there is long term association between corruption index and economic growth. The long run estimates indicated that corruption has direct negative impact on per capita GDP economic development of Bangladesh. The findings implied that corruption has increased in the level of public sector and also had no significant effect on GDP.

Del Monte & Papagni (2001) applied a dynamic panel model to find out the effect of corruption on economic growth in 20 regions of Italy (Northern and Southern regions). The study's theoretical framework on a model of growth where corruption

arises from market relations between government and private agents. The results showed that public expenditure is efficient in regions where corruption is low. The effect of corruption is significant and distinct from a direct negative one of corruption on the growth rate.

Lambsdorff (1999) studied reviewed literature on the effects of corruption on GDP and established that GDP caused corruption and that the vice versa holds. Following Solow- Barrow cross country growth regression framework for over the period of 1960-85 for 70 countries, Mauro studied the effect studied the effect of corruption on economic growth. The study established the corruption has a negative influence on economic growth.

Li, Xu, & Zou (2000) in their study corruption, income distribution, and growth sought show the effects of corruption on income distribution and economic growth for the time 1980 to 1992. The study utilized data from various continents. Among the pair's continents were: Latin America and Asia; Latin America and the OECD; and Asia and; the OECD and Africa was excluded because of it had few observations. It was shown that corruption and affects income distribution in an inverted U-shaped way and further it has negative effect on economic growth and moreover, corruption alone explains little of the continental growth differentials.

Ghazi (2014) evaluated corruption and growth by applying panel data that was obtained from Transparency International, World Bank and Penn World tables. A sample of 38 developing countries over the period of 2000-2007 was used. Other variables included in the study included trade openness which was a control variable, investment and foreign direct investment through corruption index and economic

growth. The results indicated that an increase in corruption index by one percent leads to decrease in GDP by approximately 1.64 percent

Smits (2019) did a study on corruption and economic growth in Africa. The study was motivated by contradicting statements concerning corruption. While other studies showed that corruption is an impediment to economic growth while others contented that corruption is a device that saves a troublesome nation. The study used four different empirical models, estimated using data from 46 African countries, to show that between 2000 and 2017, corruption was a negative variable on economic growth within Africa. This implied that there is a strong negative correlation between corruption and economic growth and that countries that are more corrupt, tend to grow slower than countries that are less corrupt. Additionally, the results showed that the effect was weaker in poorer economies.

Omodero (2019) investigated the consequences of corruption on economic development in Nigeria. The study made use of the position of Nigeria in the country corruption classification captured by Transparency International and the rate of corruption prevailing in the country to evaluate the extent of influence corruption has on economic growth of the country. The study employed secondary data found from World Bank Development Indicators and Transparency International which cover a period of ten years. The regression result indicated that the country corruption classification has a significant negative impact on economic growth in Nigeria whereas the rate of corruption dominant in the country had a significant positive influence on economic growth in the country. The two results were significant and therefore the study concluded that the image of the country has been tarnished globally due to the high level of corruption in Nigeria and as internationally perceived. Consequently, significant investment opportunities avoid the country even

all the same the economy is rising with the high rate of corruption prevailing in the country. The study recommended amongst others that the religious clergy and non-governmental organizations should help in decreasing the threat of corruption by instilling moral values in the young age group who should grow up to say no to corruption and its magnetisms.

Grundler *et al.,* (2019) investigated corruption and economic growth in Nigeria. The relationship between corruption and economic growth had been researched for a long time. However, majority of the empirical studies measured corruption by the reversed Transparency International's Perception of Corruption Index (CPI) and ignored that the CPI was not comparable over time. The CPI is comparable over time since the year 2012. The study employed new data for 175 countries over the period 2012 to 2018 and re-examine the relationship between corruption and economic growth. The results showed that corruption causes a decrease the economic growth. The effect of corruption on economic growth was majorly prominent in absolutisms and conveys to growth by reducing foreign direct investments and causing an increase in inflation.

Nurdeen *et al.,* (2019) conducted a study on the determinants of corruption in Nigeria. Curbing corruption has been one major problem facing government and decision makers in Nigeria. The study employed the Autoregressive distributed lags technique to analyze the determinants of corruption in Nigeria over the period 1984–2016. The outcome of the cointegration test indicated that corruption and its determinants have a long-run relationship.

The results of the Autoregressive distributed lags estimation establish that economic development, political rights, military expenditure, rents, civil liberties and openness, are the leading determining factors of corruption in the long run. Higher-economic

development, greater civil liberties, more openness and higher military expenditure are connected to reduce corruption, but higher rents and political rights are related with higher corruption. Grounded on these outcomes, the study recommended policies to stimulate economic growth, civil liberties, political rights and openness, comprising decreasing the dependence on the oil sector to control corruption in Nigeria.

Obamuyi *et al.,* (2019) investigated the effects of corruption on economic growth as measured in real Gross Domestic Product (GDP) per capita growth in Nigeria and India because of the pervasive corruption in the two low-income countries. The study employed Mo's framework (2001) for examining corruption and growth mechanism. The data for the study which covered 1980-2015 was extracted from the World Bank data repository. Corruption was measured by the Corruption Perception Index. Population growth rate, trade openness, education and the output of agriculture, industry and service sectors were also included in the study as the independent variables. Correlation coefficients were used to show a correlation between corruption and GDP growth rate for both countries.

Ordinary Least Square regression was used to estimate the effects of corruption on economic growth. From the regression, the study found out that Corruption has a stifling effect on economic growth when the measures of human capital, political instability and capital formation were not included in the estimation for India; Corruption has a positive effect on economic growth when the measures of human capital, political instability and capital formation were included interchangeably and combined together in the estimation for India; Corruption was found to have a stuffy effect on economic growth when the measures of human capital, political instability and capital formation were both included and exclude Corruption and economic growth in India and Nigeria. The diffusion mechanism results showed that corruption

adversely affects economic growth through investment and human capital in both countries.

Mwangi *et al.,* (2019) carried out a study to establish the association between corruption and capital flight in Kenya over the period spanning from 1998 to 2018. The study utilized the quarterly time series data which were sourced from the Central Bank of Kenya and Kenya National Bureau of Statistics (KNBS). Corruption perception index data was collected from the Transparency International website. Two Autoregressive Distributed-lagged models were fitted. Regression coefficients for corruption and the rest of the variables were negative but not statistically significant both in the short-run and in the long-run. Regression results of lagged capital flight on capital flight showed a coefficient of 0.904 which was statistically significant. Thus, the study suggested that the government should formulate policies that would stop more capital flight and produce capital flight reversal.

Bass (2019) aimed at assessing the influence of institutional quality and world oil prices on performance of Russian manufacturing sector. The study utilized time series data that were collected since 1996 to 2017 for Russia. The study explored that the relationship between institutional qualities, which was measured using the corruption perception index, world oil prices and performance of Russian Gross Domestic Product using the Vector Error Correction model. To check for the casual relationship, Granger causality test was conducted. The regression findings of the study confirm that oil prices, institutional quality and economic growth in Russia are cointegrated in the long run. But the short-run effects are not statistically significant. The Granger causality test results showed that there is a unidirectional causality running from oil prices and institutional quality to economic growth in Russia.

Ouma (2019) studied the effect of tax reforms, economic growth and political environment on total tax, direct tax and indirect tax revenues spending annual data for the period 1964-2016. Various techniques of analysis were employed. The study established that: all taxes responded positively to each of the tax reforms; changes in all taxes were affected by the reforms because GDP was also growing; economic growth has positive significant effect on all the categories of taxes; Government effectiveness has positive impact on indirect taxes; and that even though government control of corruption effect on tax revenues is statistically insignificant, it could promote the revenue generation more than economic growth. The study findings suggested the following policy guidelines: that the government should put more weight on governance to enhance revenue collection. Government effectiveness and control of corruption would go a long way to enhance tax compliance, reduce tax avoidance and evasion, eliminate illicit flows and reduce illegal collusion between taxpayer and tax administrator that may deprive government of due revenues.

Dankumo *et al.,* (2019) sought to study the impact of public expenditures and corruption on poverty in Nigeria. The study used time series data for the analysis, these data was sourced from the central bank of Nigeria, Nigeria bureau of statistics, and World Bank from 1996 to 2016). Autoregressive distributed lags model was employed. The outcomes of the study showed a long run negative relationship between expenditures and poverty, with only expenditures on economic been significant, while that of social sector is not, meaning of the former impact while the later does not impact. Corruption is positively related to poverty, as CPI increases, the poverty rate also increases.

2.4.4 Relationship between Foreign Exchange Rates and Economic Growth

It is often argued that small economies are mostly dependent on larger economies and wisdom holds that conditions in the larger or rather developed economies and its effect often spills to the small, less developed and open economies (International Monetary Fund, 2007). One of the major implications is that interest rate of the developed economy is that interest rate change has a strong on small economies. Empirical studies suggest that small open economies with exchange rate regimes may give up their domestic monetary currency and the resultant impact is that the interest rate of the base countries affects floats and pegs of the recipient countries (Arora & Vamvakidis, 2004).

In a study he conducted in Nigeria in 2009, Rano-Aliyu found that the appreciation of exchange rate exercise has a favorable effect on actual economic growth in Nigeria. It is more satisfying when the currency appreciates than when it depreciates, even though the appreciation of the exchange rate will result in a loss of competitiveness since the economy generally lacks the capacity to appropriate gains through competition. This is because appreciation will reduce inflation, increase domestic investment and savings, and raise living standards.. According to Aliyu (2011), an increase in the exchange rate results in more imports and fewer exports, whereas a decrease would increase exports and decrease imports.

Additionally, a decline in the value of the currency may result in a shift from imported to domestic commodities. By changing the terms of trade, it results in the transfer of income from importing to exporting countries, which tends to have an effect on both countries' economic growth. For the years 1980 to 2010, Asher (2012) examined the effects of exchange rate fluctuations on Nigeria's economic growth. The outcome

showed that the real exchange rate has a favorable impact on economic expansion. Akpan (2008) looked at the foreign exchange market and economic expansion in a growing petroleum.

The relationship between Nigeria's economic growth between 1970 and 2010 was also examined by Obansa et al. (2013). According to the findings, exchange rates have a significant influence on economic growth. They found that because it fosters economic growth, exchange rate liberalization benefits the Nigerian economy. The impact of exchange rate volatility on macroeconomic performance in Nigeria from 1986 to 2010 was also examined by Azeez, Kolapo, and Ajayi (2012). They found that the relationship between the exchange rate and GDP is positive. Adebiyi and Dauda (2009) disagreed, on the other hand, that trade liberalization encouraged growth in the Nigerian industrial sector and stabilized the currency rate market between 1970 and 2006. They did this by using an error correction model. According to them, the relationship between the index of industrial production and real export was favorable and considerable. The index of industrial production grows by 12.2% for every 1% increase in real exports. It follows that the deregulation policy affects export in a positive way by causing the exchange rate to depreciate.

According to Liu Lixin and Li Pengtao (2019)[1], the background of RMB two-way floating and economic structure transformation, respectively studied from two perspectives of directional and non-directional changes in exchange rate, has different influences on economic growth under different conditions. Zhang Yang(2018)[2] made the point that, when using exchange rate as the intermediate aim, exchange rate has a major impact on economic growth. Based on the evolution history and logic of competitiveness and stability real exchange rate policy, Ba Shusong and Hu Jun

(2019) categorized theoretical and empirical studies on real exchange rate policy and economic growth in recent years in three historical periods. They emphasized how crucial it is to develop an exchange rate strategy that takes.

When a currency moves upward, it is said to be appreciating, while a downward movement means it is depreciating (losing value) in relation to other currencies (Anyanwu et al. 2017). Real option theory, interest rate parity theory, purchasing power parity, classical flow theory, and other theories can all be used to explain why the exchange rate fluctuates up and down. Real option theory states that the impact of macroeconomic uncertainty on investment decisions is closely related (Dixit et al. 1994). Therefore, the behavior of investor decisions can be explained by the exchange rate volatility as a signal of uncertainty. For businesses that choose to raise their investment, stable exchange rates become more appealing. As a result, researchers employ the real option theory to investigate the relationship between exchange rate volatility and economic growth. The empirical literature on the impact of exchange rate volatility on economic growth is controversial, so it is important to review the research on the ways in which this impact manifests itself in the actual economy. Schnabl (2008) noted that international commerce, foreign direct investment, and macroeconomic stability are the three pathways via which exchange rate volatility might promote economic growth.

Jamil et al. (2012) looked at the impact of exchange rate volatility on growth across two time periods for four non-Euro adopting nations and eleven European countries that are members of the European Monetary Union. For the countries analyzed, the findings are varied, but the common currency lessens the negative effects of exchange rate fluctuation on industrial productivity (Janus and Riera-Crichton 2015).

Furthermore, both before and after the introduction of a common currency, exchange rate volatility had a negative effect on Germany and Denmark. For countries in an economic catch-up process where the capital market is still immature and macroeconomic instability tends to be high, the study by Schnabl (2008) reveals a negative relationship between growth and exchange rate volatility.

The study by Janus and Riera-Crichton (2015) used Instrumental Variables estimation (IV) to examine the impact of exchange rate instability on economic growth for an annual panel of OECD countries between 1980 and 2011 and demonstrated that real effective exchange rate volatility is negatively associated with economic growth. However, the study by Bagella et al. (2006) found that nations with flexible exchange rates had greater advantages than nations with fixed exchange rates because they can absorb shocks more readily. In this approach, countries with flexible exchange rate regimes perform economically well, and exchange rate volatility helps them develop

Di Giovanni & Shambaugh (2008) explored the connection between foreign interest rate and economic growth of the major industrialized nations. Panel data was applied for the period. The findings showed a negative relationship between economic growth and economic growth. Foreign interest rates do not have a direct effect on the domestic economy. But it revealed that they may operate through some channel and have an indirect impact either by affecting domestic interest rates or other variables that contribute to annual GDP growth. Some of the interest rate that are identified are Domestic interest rate channel, Exchange rate change channel- An increase in the base rate may cause the base currency to appreciate against all other currencies meaning that any floating country will depreciate against the base and Exports to base channel.

Shambaugh, & di Giovanni (2006) studied the impact of foreign interest rates on the economy and the role of exchange in the economy. They argued that the economies of small economies are affected by the activities of their larger counterparts. The paper thus explored the relationship between interest rates and economic growth of the major industrialized nations and the less industrialized countries. The findings showed that high large-country interest rates have a contractionary effect on annual real GDP growth in the domestic economy, but that this effect is centered on countries with fixed exchange rates. The paper then examines the potential channels through which large-country interest rates affect small economies. The direct monetary policy channel is the most likely channel when compared with other possibilities, such as a general capital market effect or a trade effect. It is further noted that base countries real output is negatively affected with interest rates, similarly countries with pegged exchange rate will have the same effect.

Muhammad & Sahibzada (2017) Investigated the effect of interest rate on economic growth among 20 Asian countries for the period 2006- 2015. It utilized a sample of 20 companies selected convenience sampling. The variable in the interest rate, foreign direct investment, and inflation as the dependent variable while economic growth was the dependent variable. The study findings indicated that interest has a negative on economic growth among Asian countries while inflation was insignificant. In the study it was recommended that the government should design policies that can be used to stabilize economies. Baharumshah, Haw & Fountas (2005) studied the effect of reverting behavior of real of interest rate parity in East Asian countries in a pre-and post-liberalization era using Japan as the base year. In the study, unit root tests showed that Real Interest Parity (RIP) for at least half of the countries even for the

post-financial liberalization period. In study it was also found out that the interest rate has a half-life of approximately 6 months.

Lacoviello & Navarro (2019) analyzed the effects of higher foreign interest rate and its spillover effects to the developing world and emerging economies GDP. The study utilized a panel data of 50 countries both from emerging and advanced economies. The exchange rate in each of the countries and it allowed to vary in accordance with it exchange rate, trade openness, current account balance, inflation, external debt and foreign reserves. Large heterogeneity is observed between developing and advanced economies to the US interest rate surprises that is dependent on three factors: the exchange rate regime against the dollar, trade openness with the United States, and index of external vulnerability that is interpreted as capturing a country's financial fragility explains a sizable component of differences across economies with GDP falling much in more vulnerable countries because of the US tightened monetary policies. It is also indicated that US GDP monetary tightening policies causes a decline in foreign countries with larger drop being experienced in emerging countries than the advanced economies. Further, large part in decline is from trade openness and exchange rate.

2.5 Corruption as a Moderator

Corruption refers to all activities which are not considered moral and ethical. Since corruption impedes both economic and developmental growth, it is a wide concept with significant consequences to both. In addition to harming domestic or foreign investment and economic development, corruption also makes poverty worse, according to the United Nations Development Program (UNDP), which defines it as the misuse of official power for personal gain through extortion, bribery, influence peddling, prejudice, deception, or embezzlement (Quah, 2006). The problem of

corruption or unethical behavior is universal (i.e., pervasive in all places and times) and compulsive (i.e., depressing the effectiveness and legality of governments, the governmental structure, and the market or economic system setup) (Choi, 2014). Observing this widespread tendency on a global scale, various academics have worked to improve. Corrupt acts or practices are defined in terms that help define the concept for investigation.

The concept of corruption is around abstaining from official duties in order to pursue personal benefits or gains. Corruption is typically understood as abusing government power for personal gain. Corruption can be seen in a variety of illegal management and/or monetarist actions taken by people working for the government for their own, visible or invisible personal gains. The illustrative types include coercion profiteering by forceful methods, theft or dishonesty, favoritism manifested as nepotism and special treatment, and bribery-like inducements and pay-offs (Rose-Ackerman, 2013). Several scholars have examined the link between e-governance and corruption (Lupu & Lazăr, 2015), however Mistry and Jalal (2012) were the first to prove causality for this significant association. Their study's findings suggested that using ICT for e-governance reduces corruption. The authors also discovered that the impact of e-government is greater in developing nations than in wealthy nations in their investigation conducted between 2003 and 2010. According to the theoretical framework, trust and corruption have a complicated relationship, and a high frequency of corruption will make people feel less trusting of their government. Corruption and corrupt practices have a twofold effect: they undermine the practices of e-government, good governance and economic activities; further, decrease the public trust (Jameel, Asif, & Hussain, 2019).

In the presence of e-government practices, corruption has a minimal impact on trust and development and its consequence are small in number. Trust may be defined as the extent to which the public or individuals can rely upon others. The E-administration of local bodies is precisely linked to the trust of individuals. The difficulty of the administrative setup boosts corruption and corrupt practices and then cuts the public trust. Corruption weakens transparency, and diminishes and weakens the transparency and accountability structure. High-level corruption results in a low level of citizens trust (Zhang, Gupta, & Zhao, 2014)

According to studies, corruption makes it more difficult for the government to distribute tax dollars to the people fairly (Gupta et al., 2002). Low corruption does not always result in reduced inequality, according to Dobson and Ramlogan-Dobson (2012). They made the case using Latin American nations that low levels of corruption would lead to greater inequality in nations with sizable informal economies. They claimed that in nations with sizable informal economies, these markets accounted for the majority of people's income. Because the poorest people were not eligible to work in the official market, legislation and regulations enacted to combat corruption have an impact on the informal sectors, which has an impact on the source of income for the poorest people. As a result, income disparity increases.

2.6 Critique of Literature Review

From literature the results indicate that corruption is detrimental to economic growth of countries while in some instances, corruption may be desirable for instance (Acemoglu and Verdier, 1998). It argued that corruption acts a pay rate for the bureaucrats which will in turn act as an inducement of more efficient government services and in turn provides entrepreneurs to bypass inefficient government services. corruption is also thought to promote allocative efficiency by allowing agents to

circumvent these procedures or policies; yet the first-best policy would be to remove the distortions themselves.

It is also shown from review of literature that the exact channels through which the economy is affected have not been resolved empirically and therefore this study tries to resolve this ambiguity by developing analytical framework to analyze the effect of corruption, investor protection and credit access to private affect economic growth in COMESA countries.

The existing evidence on the links between democracy and economic growth does not provide a clear-cut support of the idea that increased democracy causes growth. Some early studies, such as those by Kormendi and Meguire (1985) and Scully (1988) found statistically significant effects of measures of political freedom on growth. However, more recent studies have provided ambiguous results (see Helliwell, 1994, Przeworski and Limongi, 1993, and the survey by Brunetti, 1997).

2.7 Conceptual Framework

The relationship between variables being studied can be conceptualized as shown in the figure 2.1 below.

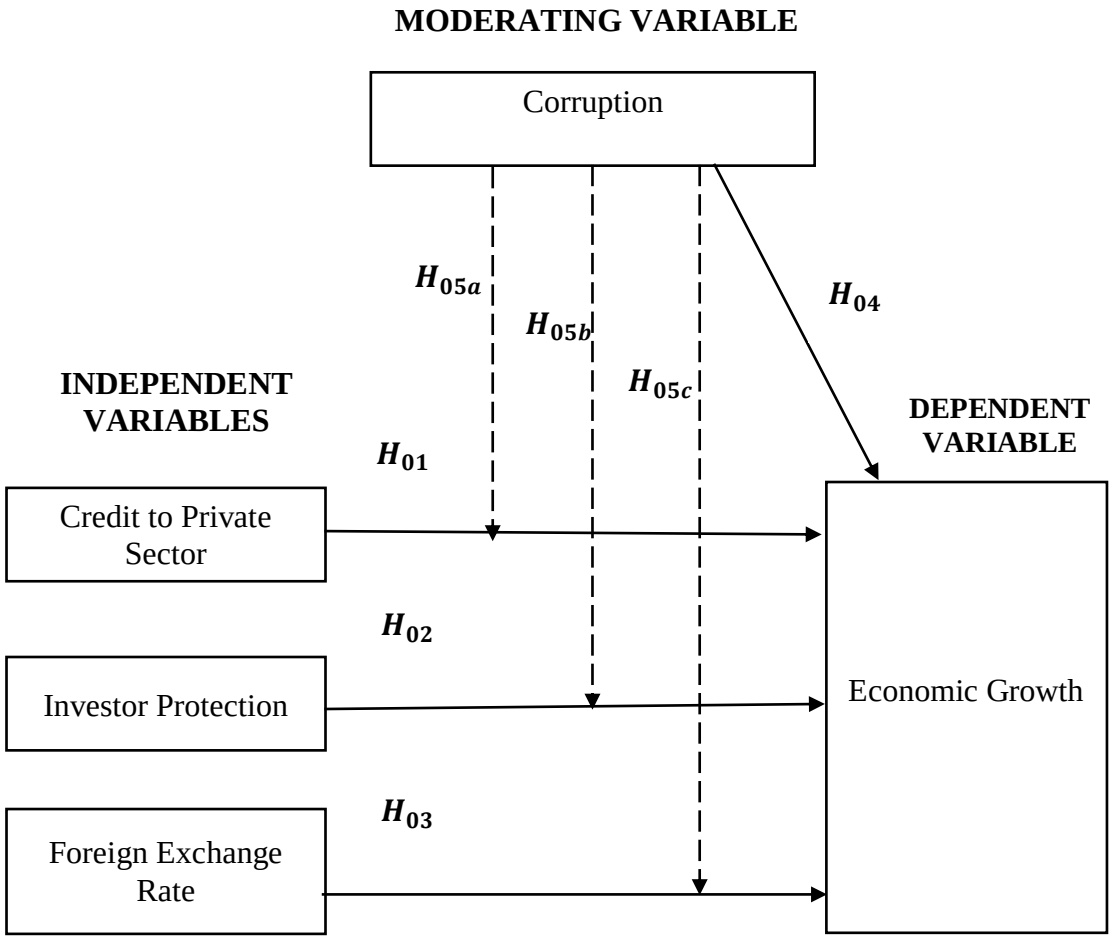

Figure 2. 1: Conceptual Framework

Source: Researcher's Conceptualization, 2020

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

This section of the thesis deals with the research methodology that was followed to collect data and estimation procedures to test the hypotheses of the study. The first part covers research design, target population, sampling design and procedure, data collection, and analysis. The second part presents descriptive statistics such as correlation analysis, panel unit root tests. This section also presents model specification and panel cointegration technique. The last section discuses multivariate assumptions of linear regression such as normality, multicollinearity, heteroscedasticity, and test for serial correlation.

3.2 Research Paradigms

The research paradigm is a collection of assumptions about how things work that unites a number of research approaches through underlying philosophical beliefs that support the research process. In terms of conceivable research techniques, three distinct research paradigms are identified: positivism, interpretivism, and pragmaticism (Scotland, 2012; Shah & Al-Bargi, 2013). Because positivism entails quantitative data analysis on the idea that objective truth exists and requires systematic methods and techniques to find it, this study follows the positivist research paradigm. Thus, a set of chance-based causal rules should be used to discover this objective reality through empirical observation of individual behavior and pattern prediction (Venkatesh, Brown &Bala, 2013). Positivists believe in deterministic philosophy, in which causes are the most likely drivers of effects or outcomes. Positivism seeks to break down complex ideas into specific factors that may be tested, such as hypotheses and research questions (Creswell, 2014). It is reasonable to say

that this study has aspects of positivism because it intended to analyze the causal relationship between credit to the private sector, investor protection, foreign currency rate, corruption and economic growth among COMESA nations and moderation corruption. The researcher can make statistical judgments when using the positivist paradigm.

3.3 Research Design

A research design is a blueprint that lays out the methods and procedures for gathering and analyzing the data needed to answer research questions (Zikmund, 2010). The purpose of this study was to determine the impact of the relationship between investor protection, credit to the private sector, foreign exchange rate, corruption, and economic growth among COMESA countries using an explanatory research approach. The purpose of the research design is to investigate and comprehend the cause-and-effect relationship between variables. Panel data, which is part of an explanatory design, allows for the testing and change of cross-sectional analysis assumptions (Maddala, 2001; Baltagi, 2005). Panel data provide additional facts, variability, and competency, as well as the ability to comprehend and measure effects that are not visible in cross-section analysis. The panel study design is useful for tracing changes over time and linking them to variables that may explain why they occur. It helps identify the direction and size of causal links by describing patterns of change. The design enables for the measurement of differences or changes in a variable from one period to the next (i.e., the description of patterns of change over time) as well as the prediction of future events based on previous outcomes.

3.4 Target Population

The study focused on African countries that are members of COMESA. The Common Market for Eastern and Southern Africa (COMESA), based in Lusaka (Zambia), is the

successor organization to the regional Preferential Trading Area (PTA), which went into effect on December 8, 1994. Burundi, Comoros, DRC, Djibouti, Egypt, Eritrea, Ethiopia, Eswatini, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Somalia, Sudan, Tunisia, Uganda, Zambia, and Zimbabwe are now members of COMESA. With a population of about 430 million people and a combined GDP of US$ 447 billion, COMESA is Africa's largest economic community (WEO, 2017). The study focused on African countries that are members of COMESA. The Common Market for Eastern and Southern Africa is based in Lusaka (Zambia). COMESA's principal goals, like those of other regional economic blocs, are to eradicate member states' structural and institutional shortcomings while also promoting political stability and long-term economic growth (COMESA).

The Southern African Development Community includes eight COMESA members: DRC, Madagascar, Malawi, Mauritius, Seychelles, Swaziland, Zambia, and Zimbabwe (SADC). Despite having an abundance of natural resources, the region's countries remain among the poorest in the world. The COMESA grouping includes 13 of the 21 countries classified among the world's poorest countries, according to a World Bank assessment from 2007. The research looked at 18 nations that are part of the COMESA economic group (for COMESA countries see appendix I).

3.5 Inclusion Criteria and Exclusion Criteria

All nations that are members of COMESA are included in this study. Countries that have statistics and information for the 2000-2020 study period. COMESA has 21 member states at the moment. Angola, Burundi, Comoros, DRC, Djibouti, Egypt, Eswatini (previously Swaziland), Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Somalia, Sudan, Uganda, Zambia, and Zimbabwe are

among them. Angola, Libya, and Somalia were left out due to data inconsistencies and the fact that they joined late.

3.6 Sources of Data

Data was gathered from a variety of reliable sources. The World Bank website included information on investor protection (INP), credit to the private sector (CPS), and foreign exchange rate (FER). Transparency International provided data on the Corruption Perception Index (CPI). Transparency International tracks countries' performance integrity and creates a corruption perception index (Mo, 2001). In this analysis, it is considered that no country in the COMESA region has a perfect level of 10 and 0.

3.6.1 Operationalization and Measurement of Variables

Table 3.1 presents variable description, measurement, and hypothesized relationship with dependent variables.

Table 3. 1: Description and Measurement of Variables

Variable	Description	Measurement	Expected Sign
Economic growth (ECG)	Economic growth refers to the method and policies that a country uses to increase the economic, political, and social well-being of its citizens (Aron, 2010). Economic growth, according to Mankiw (2014), is defined as an increase in real GDP (gross domestic product)	The percentage growth in real gross domestic product is used to calculate it (GDP).	
Investor protection (INP)	It is a process or mechanism that safeguards an investor's interests in the securities market. Essentially, it refers to the actions taken with the goal of bringing and maintaining transparency in procedural aspects when dealing with investors through some regulatory bodies and appropriate legislation (Chu et.al., 2017)	Strength of investor protection. It is an index variable	Positive
Credit access to private sector (CRA)	Financial corporations give financial resources to the private sector, such as loans, non-equity securities purchases, trade credits, and other accounts receivable, which establish a claim for recovery (Kiriga, Chacha & Omanyo, 2020;	A ratio of credit issued to private sector divided and GDP, excluding credit issued to the Government agencies and public enterprises.	Positive

	Nzomoi, Were, & Rutto, 2012).		
Foreign exchange rates (FER)	The rate at which one currency is exchanged for another is known as the exchange rate. National currencies are the most frequent. This is the exchange rate between a country's currency and the US dollar (Chen, 2012; Baiden, J. E. 2011).	Percentages	Negative
Corruption perception index (CPI)	Corruption can be recorded or quantified in a variety of ways; the following are some indicators that can be used to capture the corruption perception index (CPI). Bribery, misappropriation of public funds, the widespread use of public office for private benefit without repercussions, and governments' ability to contain corruption and impose effective integrity procedures in the public sector are among them, red tape and excessive	Corruption index is measure as a range from 0 to 10. In this regard zero is regarded as the highest level of corruption while 10 implies less corrupt. There is no perfect level of 10 and 0 for any countries in this analysis.	Negative

Source: Researcher, 2020

3.7 Data Analysis

This section presents the procedure and regression models that was estimated to answer the research hypotheses. The study used panel data to learn about economic processes while accounting for both country heterogeneity and dynamic impacts that are not obvious in cross sections (Baltagi, 2005).

3.8 Descriptive Statistics

Descriptive statistics were computed before estimation to generally have a view summary of the data and to observe and remove outliers in the data before carrying out analysis (Wigginton, and Abecasis, 2005). Descriptive statistics such as mean, median, kurtosis, skewness also computed. Graphs for variables at levels were plotted to show the general trend of macroeconomic variables.

3.8.1 Correlation Analysis

The strength and direction of link between variables is determined via correlation analysis. Given the nature of the data and the necessity to examine the strength of association that may exist among the research variables, a Pearson (r) correlation coefficient was calculated. The strength of association of relationship between macroeconomic variables might differ among in various circumstances (Wagner *et al.*, 1998).

3.9 Panel Unit Root Tests

Panel data are trending in nature that they contain unit root and therefore prior to undertaking estimation the trending effect must be removed. The conventional way of de-trending a non-stationary panel data performing is differencing, and this removes unit root (Wasal and Saunders 2000). in Time series and cross-sectional qualities are present in panel data. When panel data variables with unit root are regressed, the

findings are erroneous. As a result, the data was checked for the presence of unit root before doing regression analysis. Different panel unit root tests are recommended by Judge, Griffits, Hill, Lutkepohl, and Lee (1985) and Greene (2012) to verify for consistency and robustness. As a result, to check for unit root, the following panel unit root tests were employed.

3.9.1 Levin-Lin-Chu Panel Unit Root Test

The following model is estimated using the Levin-Lin-Chu panel data unit root test:.

$$\Delta y_{it} = \rho y_{it-1} + \alpha_{0i} + \alpha_{1i} t + \varepsilon_{it},\ i = 1, 2 \dots \dots N,\ t = 1,2 \dots \dots T \ldots\ldots\ldots\ldots\ldots 3.1$$

Where ε_t is a white noise series, $\rho = 1$ Indicates a unit root $0 < \rho < 1$ implies stationarity (Levin, Lin and Chu, 2002; Phillips and Moon 1999 and Phillips and Moon, 2000). Levin Lin Chu assume homogeneous autoregressive coefficients between individuals for instance $\rho_i = \rho$ for all i. Under the LLC, the null hypothesis $H_0 = \rho_i = \rho = 0$ against alternative hypothesis $H_a = \rho_i = \rho < 0$ for all i.

3.9.2 Im-Pesaran-Shin Unit Root Test

The Dickey-Fuller (DF) test is extended by the Im-Pesaran-Shin (IPS) test. For stacked panel time series, the IPS test is commonly stated as:

$$\Delta y_{it} = \alpha_{0i} + \rho_i y_{it-1} + \sum_{j=1}^{pi} \varphi_{ij} \Delta y_{it-j} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.2$$

Where ε_t is the error term series, the null hypothesis is $H_0 = \rho_i = 0$ for all against alternative hypothesis $H_a = \begin{cases} \rho_i < 0 & for\ i = 1 \dots N\ with\ 0 < N_1 \leq N \\ \rho_i = 0 & for\ i = N_1 + 1, \dots, N \end{cases}$ This allows for unit roots in certain (but not all) individual series (Im, Pesaran and Shin, 2003; Pesaran, Shin and Smith, 1997; Pesaran, Shin and Smith, 1999 and Pesaran and Smith, 1995).

3.10 Specification of the Model

Synchronous correlation The model was fitted using a generalized least squares regression with linked disturbances. Baltagi (2005), Arrelano (2003), Hsiao (2007), and Wooldridge (2010) are references. The following is the equation that was used to create the estimating model.

$$Y_{it} = \beta X_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \; 3.3$$

Where $i = 1,2,3,\cdots,21$ is the number of countries in COMESA trading block, Y_{it} is growth rate, $t = 2000,\cdots,2020$, X_{it} are the independent variables.This is stated as

$$\begin{bmatrix} Y_1 \\ Y_2 \\ \vdots \\ Y_n \end{bmatrix} = \begin{bmatrix} X_1 \\ X_2 \\ \vdots \\ X_n \end{bmatrix} \beta + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \vdots \\ \varepsilon_n \end{bmatrix} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \; 3.4$$

$Y_1, Y_2, \cdots, Y_n$ is the dependent variable for each country under study. $X_1, X_2, \cdots, X_n$ are the independent variables, β is matrix of parameters that is estimated and $\varepsilon_1, \varepsilon_2, \cdots, n$ is a matrix of random error term assumed to *IID*(0, δ^2) that is a white noise process. The variance matrix of the disturbance terms is expressed as;

$$E[\varepsilon\varepsilon'] = \Omega = \begin{bmatrix} \sigma_{1,1}\Omega_{1,1}\sigma_{1,2}\Omega_{12} \ldots\ldots\ldots\ldots \sigma_{1,21}\Omega_{1,21} \\ \sigma_{2,1}\Omega_{2,1}\sigma_{2,2}\Omega_{2,2} \ldots\ldots\ldots.. \sigma_{2,21}\Omega_{2,21} \\ \vdots\vdots\ddots\vdots \\ \sigma_{21,1}\Omega_{21,1}\sigma_{21,2}\Omega_{21,2} \ldots. \sigma_{21,21}\Omega_{21,21} \end{bmatrix} \ldots\ldots\ldots\ldots\ldots\ldots \; 3.5$$

In these models, an assumption is made that the coefficient vector β is the same for all panels and consider a variety of models by changing the assumptions on the structure of Ω. Following Madala and Lahiri (2006) this shows that Ω has the structure given by;

$$\Omega = \begin{bmatrix} \sigma^2 I 0 \cdots 0 \\ 0 \sigma^2 I \cdots 0 \\ \vdots \vdots \ddots \vdots \\ 0 0 \cdots \sigma^2 I \end{bmatrix} \ldots\ldots 3.6$$

3.11 Heteroscedasticity across Panels

The variance for each of the panels differs in many cross-sectional datasets. Data on countries, panels, or other units with varying scales is quite prevalent. The panels (heteroscedastic) option is used to specify the heteroscedastic model, which assumes

that: $\Omega = \begin{bmatrix} \sigma_1^2 I 0 \cdots 0 \\ 0 \sigma_2^2 I \cdots 0 \\ \vdots \vdots \ddots \vdots \\ 0 0 \cdots \sigma_{21}^2 I \end{bmatrix} \ldots\ldots 3.7$

Equation 3.7 guarantees spherical disturbance and no autocorrelation in regression results.

3.12 Panel Linear Regression Analysis

This study used multivariate panel regression analysis to examine the specific hypotheses. The capacity to assess the between-groups is one of the most useful elements of panel data analysis (heterogeneity). This is done to isolate the major effects of independent variable mechanisms on economic growth while also assessing how each independent variable influences the dependent variable independently.

3.13 Specification of the Econometric

The specifications of an econometric model based on econometric theory and any relevant knowledge about the phenomena. For this investigation, the econometric model is stated as.

$$ECG_{it} = \beta_0 + \beta_1 CPS_{it} + \beta_2 INP_{it} + \beta_3 FER_{it} + \nu_{it} + \varepsilon_{it} \ldots\ldots 3.8$$

where: ECG_{it}= economic growth which is dependent variable; β_0 = intercept, INP_{it} = Investor protection; CPS_{it}= credit to private sector; FER_{it} = foreign exchange rate; $\nu_{it} =$ Individual specific effects and ε_{it} = Stochastic error term. The coefficient $\beta_1, \dots, \beta_3$ are the slope parameters to be estimated by panel regression analysis.

3.14 Panel Cointegration Test

In recent years, the panel cointegration test with both a time series dimension T and a cross sectional dimension N has gotten a lot of attention. Cointegration testing allows for improved power not only across a time series dimension but also across a cross-sectional dimension. Even though theory strongly suggests cointegration, many research fail to reject the null hypothesis of no cointegration. The Panel Test for Cointegration was used to see if there is a long-term relationship between economic development, investor protection, perceptions of corruption, private sector lending, and foreign exchange rates. As a result, the Johansen Cointegration test was used to check for cointegration between variables. According to Westerlund (2007), cointegration is based on structural rather than residual dynamics, and so no shared factor restriction is imposed.

To determine if the model's variances were Co-Integrated, the Johansen Multivariate Co-Integration technique was utilized. The following is the model's estimation.

$$\Delta Y_t = \alpha\beta Y_{t-1} + \sum_{i=1}^{P} \phi_i^x \, \Delta Y_{t-i} + \delta_0 + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots 3.10$$

Where, ΔY_t is the dependent variable, α, is the degree of convergence (or rate of) long-term relationship. β' is the co-efficient for the long-term relationship and ϕ_i^x is the vector of n by n and shows short term relationship.

3.15 Testing for Time Fixed Effects

Fixed data, according to Torres-Reyna (2007), explains the link between the independent and dependent variables across entities in panel data. It is assumed that each entity has unique traits that influence the predictor variables, hence it is necessary to account for them. Fixed effects are believed to remove these time invariant properties, allowing for the analysis of the predictor variables' net impact.

In panel data analysis, testing for time fixed effect allows for the inclusion or exclusion of time effect. For this test, the null hypothesis is that the time dummies are not jointly significant. If the F statistic is significant, the null hypothesis is rejected; if the F statistic is negligible, the null hypothesis is accepted. As a result, fixed effects regression should incorporate time effects so that all years' coefficients are jointly equal to zero, therefore no time effect is required.

3.16 Specification of the Panel Data Model

Panel data regression models, according to (Schmidheiny, 2014), are most useful when it is suspected that the outcome variable is influenced by explanatory variables that are not visible but are connected with the observed explanatory variables. Panel data estimators enable for consistent estimation of the effect of observable explanatory variables if such omitted variables are constant through time. Panel data allows for the estimate of associations between two or more entities with time invariant and unobserved features. As a result, the following equation is used to create the estimating model:

$$y_{it} = \alpha + x_{it}'\beta + z_i'\gamma + c_i + \varepsilon_{it} \quad \text{.....} \quad 3.11$$

The model considers a multiple linear regression for individual $i = 1 \ldots N$ which is observed at several time periods $i = 1 \ldots T$. In equation 3.12 above, y_{it} is the

dependent variable, x_{it}' is a *K*-dimensional row vector of time – varying explanatory variables and z_i' is a *M*-dimensional row vector of time-invariant explanatory variables excluding the constant, α is the intercept , β is a *K*-dimensional column vector of parameters, γ is a *M*-dimensional column vector of parameters, c_i is an individual-specific effect and ε_{it} is an idiosyncratic error term. To account for the cross section and time heterogeneity in the model a two a two-way error component assumption for the disturbances, ε_{it}.

$$\varepsilon_{it} = \mu_{it} + \lambda_t + \nu_{it} \quad \text{3.12}$$

where ε_{it} represents the unobservable individual (cross section) heterogeneity, λ_t denotes the unobservable time heterogeneity and ν_{it} is the remaining random error term. The first two components (μ_{it} and λ_t) are also called within component and the last (ν_{it}), panel or between components.

It is assumed that each individual *i* is observed in all time periods *t* that is; the data is balanced. The *T* observations for individual *i* can be summarized as

$$y_i = \begin{bmatrix} y_{i1} \\ \vdots \\ y_{it} \\ \vdots \\ y_{iT} \end{bmatrix} \quad X_i = \begin{bmatrix} x_{i1}' \\ \vdots \\ x_{it}' \\ \vdots \\ x_{iT}' \end{bmatrix} \quad Z_i = \begin{bmatrix} z_i' \\ \vdots \\ z_i' \\ \vdots \\ z_i' \end{bmatrix} \quad u_i = \begin{bmatrix} u_{i1} \\ \vdots \\ u_{it} \\ \vdots \\ u_{iT} \end{bmatrix} \quad \text{3.13}$$

and *NT* observations for all individuals and time periods as

$$y = \begin{bmatrix} y_1 \\ \vdots \\ y_i \\ \vdots \\ y_N \end{bmatrix}_{NT\times 1} \quad x = \begin{bmatrix} x_1 \\ \vdots \\ x_i \\ \vdots \\ x_N \end{bmatrix}_{NT\times K} \quad z = \begin{bmatrix} Z_1 \\ \vdots \\ Z_i \\ \vdots \\ x_Z \end{bmatrix}_{NT\times M} \quad \mu = \begin{bmatrix} \mu_1 \\ \vdots \\ \mu_i \\ \vdots \\ \mu_Z \end{bmatrix}_{NT\times N} \quad \text{3.14}$$

3.16.1 The Random Effects Model

The individual-specific effect is a random variable that is uncorrelated with the explanatory factors in the random effects model. The individual-specific effect is

assumed to be a random variable that is uncorrelated with the explanatory factors of all previous, current, and future time periods of the same individual. The difference between random and fixed effects, according to (Greene, 2008), is whether the unobserved individual characteristics effect contains features that are correlated with the independent variables in the model, rather than whether or not these effects are stochastic. Random effects can be approximated as time invariant characteristics if there is reason to believe that these differences between panels affect the relationship between the dependent and independent variables. The following is a representation of the relationship:

$$y_{it} = \beta x_{it} + \alpha + \mu_{it} + \varepsilon_{it} \quad \text{3.15}$$

Where y_{it} is the dependent variableμ_{it} is the error between entities while $\varepsilon_{it}$is the error within and random effects assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables.

3.16.2 The Fixed Effects Model

Individual-specific effects are a random variable that can be associated with the explanatory factors in a fixed effects model. In causal relationships, the fixed effect model is extremely useful (Gangl, 2010). The error component model is used to create the fixed effect model.

$$y_{it} = x_{it}\beta + \alpha_{it} + u_{it} \quad \text{3.16}$$

In this case y_{it} denotes the outcome or the dependent variable at time *t*, x_{it} is the $(1 - k)$ vector of covariates and β is the corresponding (k-1) vector of parameters to be estimated. In this case the error term is split into two components: the α_i which

captures the unobserved effects time-constant individual heterogeneity and u_{it} is an idiosyncratic error that varies across the groups or panels and over time. The intercept α that is standard in regression models is dropped because of collinearity with the person-specific errors

3.16.3 Random Effects vs Fixed Effects Estimation

Both the RE and the FE estimators can estimate the panel model with consistency. If we are confident that the individual-specific effect is indeed unrelated, we should use RE estimators (RE1). A (Durbin-Wu-) Hausmann test is commonly used to determine this. The Hausmann test, on the other hand, is only valid in the presence of homoscedasticity and cannot account for time-fixed effects. An auxiliary regression (Wooldridge 2010 and Mundlak, 1978) is a better way to evaluate the unrelatedness assumption RE:

$$y_{it} = \alpha + x'_{it}\beta + z'_i\gamma + \bar{x}'_i\lambda + \delta_t + u_{it} \quad \text{3.17}$$

Where $\bar{x}_i = \frac{1}{T}\sum_t x_{it}$ are the time averages of all time-varying regressors? Include time fixed δ_t if they are included in the RE and FE estimation. A joint Wald-test on $H_0: \lambda = 0$ tests *RE1*. Use cluster –robust standard errors to allow for heteroscedasticity and serial correlation.

Note: The FE estimator is usually always more compelling than the RE estimator, and assumption RE1 is a very strong assumption. Accepting RE1 does not imply not rejecting it. The RE estimator should not be used just because you are interested in the effect of time-invariant variables (Baltagi, 2012).

$$Y_{it} = \beta X_{it} + \varepsilon_{it} \quad \text{3.18}$$

Where $i = 1,2,\cdots,N$ is the number of selected countries that are member states of COMESA, Y_{it} is the economic growth of each country, t years 21, X_{it} are the independent variables.

3.17 Hausman Test for Model Selection

The Hausman test was used to choose which model to apply to reject hypotheses. The Hausman test is a statistical test that determines whether the best Fixed Effect or Random Effect model should be selected. It examines the relationship between unique mistakes and regressors. The null hypothesis is that random effects are preferable to the alternative hypothesis of fixed effects (Greene, 2008). The following is the general Hausman (1978) test specification:

$$H = (\beta^I - \beta^{II})'[var(\beta^I) - var(\beta^{II})]^{-1}(\beta^I - \beta^{II}) \quad \text{3.19}$$

Hausman test is under χ^2 (k) distribution where k is the number of parameters. As stated, the null hypothesis is given as;

$$Cov(\alpha_i - x_{it}) = 0 \quad \text{3.20}$$

It illustrates that in the panel data model, there is no association between independent variables and the error term, hence random effects is appropriate. The alternative hypothesis claims that the fixed effect model is correct and that the error term and regressors are statistically significant.

$$Cov(\alpha_i - x_{it}) \neq 0 \quad \text{3.21}$$

The computed statistic is compared with critical values for χ^2 distribution for k degrees of freedom and the null hypothesis is rejected if it is greater than its critical value.

3.18 Testing the Indirect Effects

The researchers looked at how corruption in the COMESA region affected the connection between independent and dependent variables. In accordance with Andrew Hayes model 59, many models are constructed to facilitate the process of testing the conceived linkages (Hayes, 2013).

3.18.1 Testing for Panel Moderation

When the relationship between two variables is influenced by a third variable, it is referred to as moderation. The moderator variable is the third variable. A statistical interaction is used to describe the effect of a moderating variable (Cohen et al.,2003). A moderator analysis is performed to see if the value of a third variable influences (modifies) the relationship between two variables. When you choose to do a moderator analysis with multiple regression, you must first ensure that the data you want to analyze is compatible with multiple regression. If the data "passes" the assumptions required for multiple regression to give you a valid result, you can use a moderator analysis using multiple regression (Hayes, 2017).

These assumptions are similar to multiple linear regression assumptions. The dependent variable should be measured on a continuous scale, for example (either an interval or ratio variable). Data should demonstrate observational independence (independence of residuals). For each group of the dichotomous moderator variable, there must be a linear relationship between the dependent and independent variables. The data must demonstrate homoscedasticity, which means that the error variances for all combinations of independent and moderator variables are the same. Multicollinearity, which arises when two or more independent variables are substantially correlated with each other, should be avoided. Finally, residuals follow a roughly normal distribution.

The influence of credit to the private sector, investor protection, and foreign currency rate variables on economic growth was studied across all levels of corruption in this study. According to Hayes (2013), moderation occurs when the effect of the independent variable (X) on the dependent (Y) varies in response to the variance in the moderating variable (W). According to Hayes, Figure 3.1 depicts this link in a path diagram (2013).

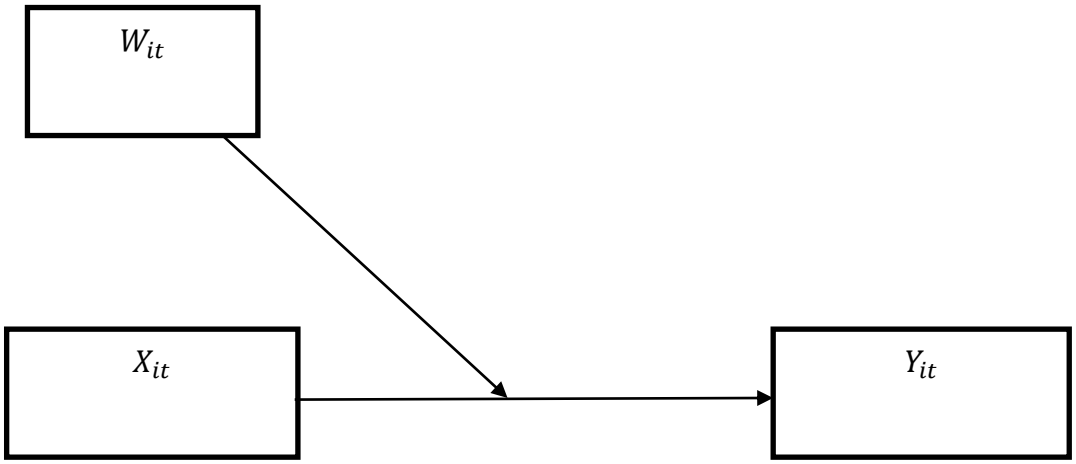

Figure 3. 1: Multiple Moderation Analysis
Source: Hayes (2013)

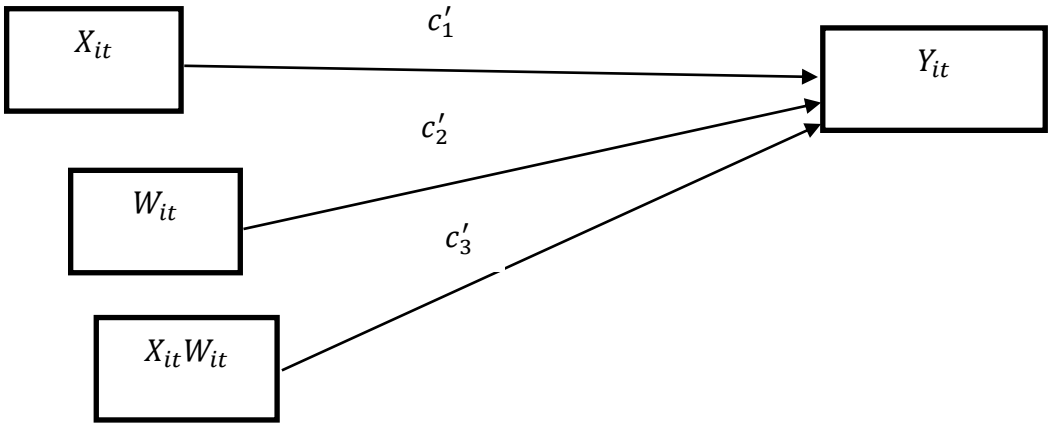

Figure 3. 2: Analytical Model

$$Y_{it} = c_0' + c_1' X_{it} + c_2' W_{it} + c_3' X_{it} W_{it} + e_{it} \quad \text{.....3.22}$$

Where, Y_{it} is the economic growth (ECG), X_{it} is the independent variable, W_{it} is the moderating variable, i is the specific country in the COMESA and t is the year while c_0' is the intercept, c_1' , c_2' and c_3' are the coefficients. c_3' measures the moderating effect of corruption index. Specifically, equation 3.23, 3.24 and 3.25 are models that measures moderation of corruption index on each of the independent variables.

$$ECG_{it} = c_0' + c_1' CPS_{it} + c_2' CI_{it} + c_3' CPS_{it} CI_{it} + e_{it} \quad \text{.....3.23}$$

$$ECG_{it} = c_0' + c_1' INP_{it} + c_2' CI_{it} + c_3' INP_{it} CI_{it} + e_{it} \quad \text{.....3.24}$$

$$ECG_{it} = c_0' + c_1' FER_{it} + c_2' CI_{it} + c_3' FER_{it} CI_{it} + e_{it} \quad \text{.....3.25}$$

3.19 Diagnostic Tests

Failing to carry out post diagnostics checks such as serial correlation, heteroscedasticity, and linearity in research, linear models cause the standard errors to be biased and the estimated coefficient to be less efficient therefore there is need to test for these diagnostics before inferences are made. Therefore, the following assumption of multiple linear regression models' checks was carried out.

3.19.1 Test for Normality

Residuals or error terms arise from the difference between observed value of the dependent and independent variable. It is important to check for normality of error in panel data analysis for both methodological and conceptual reasons. Lack of normality may lead to unreliable estimations and testing procedures. Normality plays and important role in the validity of inferences and forecasting (Wooldridge, 2002). Studies by Escudero (2011) and Baltagi *et al.*, (2006) showed that lack of normality in panel data panel affects the performance of panel heteroscedastic tests. The residuals

should follow normal distribution. To check for normality, Skewness, Kurtosis and Jarque-Bera test for normality for normality test was applied. For these tests, it considers the following one-way error component model for skewness,

$y_{it} = X_{it}b + u_i + e_{it}, i = 1, \dots N, t = 1, \dots, T$……...……...……...…. 3.26

In this case, b is a vector of parameters and u_i, e_t and X_{it} are the copies of random variables of u, e and x and u does not contain a constant while i refers to individual while the t refers to time $u_i$and e_{it} refer to the individual-specific and to the remainder error component, respectively, both of which have mean zero.

$s_u = \frac{E[u^3]}{([u^2])^{3/2}}$, and $s_e = \frac{E[e^3]}{([e^2])^{3/2}}$……...…...…. 3.27

And skewness,

$k_u = \frac{E[u^4]}{(E[u^2])^2}$, and $s_e = \frac{E[e^3]}{(E[u^2])^2}$……..…… 3.28

When the distribution is normal, the null hypothesis for skewness is stated; $H_0^{su}: s_u = 0$ and $H_0^{se}: s_e = 0$ for skewness, $H_0^{ku}: k_u = 3$ and , $H_0^{ke}: k_e = 3$ for kurtosis. For Jarque-Bera test for normality the following was estimated,

$JB = {}^{n}/_{6}\left(S^2 + {}^{1}/_{4}(K-3)^2\right)$……...…….. 3.29

where *n* denotes is the number of observations or degrees of freedom; *S* is the sample skewness, K is the sample kurtosis. Jarque-Bera tests joint null hypothesis that the sample is from normal distribution and has asymptotically a Chi square distribution.

3.19.2 Heteroscedasticity Test

The variance for each of the panels differs in many cross-sectional datasets. It's typical to have statistics on countries, states, or other entities with different scales.

The panels (heteroscedastic) option is used to specify the heteroscedastic model, which assumes that is an identity matrix written as follows.

$\Omega = \delta_{it}^2 I$…….……..…….…..…… 3.30

3.19.3 Wooldridge Test for Serial Correlation Across Panels

There are several tests that have been proposed to test for serial correlation in panel data analysis. However, many these tests require many assumptions and are not easy to implement. Wooldridge (2002) proposes new test which is easy to implement, robust and easy to interpret. Baltagi (2001) further discussed exhaustively on the test for serial correlation. Woolridge Test for serial autocorrelation starts by estimating the following linear equation.

$y_{it} = \alpha + X_{it}\beta_1 + Z_i\beta_2 + \mu_i + \epsilon_{it}$……...……...…….. 3.31

$i \in \{1, 2, \dots, N\}$, $t\epsilon\{1,2, \dots, T_i\}$

In this case, y_{it} is the dependent variable, X_{it} is $(1 \times K_1)$ is the vector of time-varying covariates, Z_i is $(1 \times K_2)$ vector of time invariant covariates, α, β_1 and β_2 are $1 \times K_1 + K_2$ parameters and μ_i is the individual level effect and ϵ_{it} is the idiosyncratic error term. If μ_i are correlated with X_{it} or Z_i, the coefficients on the time varying covariates X_{it} can be consistently estimated by regression on the within regression on the within-transformed data or the first differenced data.

If the μ_i are uncorrelated with the μ_{it} and the z_i, the coefficients on the time-varying and time-invariant covariates can be consistently and efficiently estimated using the feasible generalized least squares method for random-effects regression.

From the above linear regression, the estimators assume that$E[\in_{it}\in_{is}] = 0$ for all $s \neq t$ i.e., that there is no serial correlation in the idiosyncratic errors, which would cause

the standard errors to be biased and the estimates to be less efficient. Differencing the data Woolridge test removes the individual-level effect. This is indicated as.

$y_{it} - y_{it-1} = (y_{it} - y_{it-1})\beta_1 + \in_{it} + \in_{it-1}$……...……... 3.32

Taking the first difference,

$\Delta y_{it} = \Delta X_{it}\beta_{it} + \Delta \in_{it}$……... 3.33

Where, Δ is the difference operator.

Woolridge tests has the null hypothesis that there is no serial correlation in this specification. If in the estimation of the above equation the *F* is significant at 5 percent level of confidence, then the null hypothesis is rejected, and the alternative is adopted.

3.20 Ethical Consideration

Ethical considerations in carrying out this study before going to the field, it was required to get permission from the National Commission for Science, Technology, and Innovation (NACOSTI) to conduct the research and ensure that the data acquired was solely utilized for academic reasons. This will be accompanied by a Moi University introductory letter. Plagiarism is also taken into account when performing this research, as is acknowledging the work of other experts. Once the thesis was completed, the study findings were published and distributed to key parties. The researcher was only responsible for collecting data needed for this study and analyzing it to meet the objectives.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Overview

The goal of the study was to look at the elements that influence the economic growth of the COMESA countries. As a result, this section summarizes the findings in relation to the objectives. It starts with descriptive statistics and progresses to inferential statistics. The means, lowest and maximum values, and standard deviations are all descriptive terms. The correlation relationships between the variables are also described. The findings of the univariate properties of each panel variable (graphical representation), as well as the panel unit roots tests (Levin-Lin-Chu and Im-Pesaran-Shin) for stationarity checks, are then shown. Regression and moderation analysis, Hausman tests for model selection, panel cointegration, and hypothesis testing are all examples of inferential statistics. Charts and tables are used to present the findings.

4.2 Descriptive Statistics

Summary statistics are the results of measurements of central tendency such as mean, standard deviations, minimum and maximum values. Descriptive statistics are vital in panel analysis because they allow for the meaningful presentation of raw data and easy data interpretation (Cohen, 2014). Descriptive statistics were also calculated to get a broad picture of the sample size and to make a large data set more manageable. The summary of descriptive statistics for the sample data is shown in Table 4.1. The study period runs from 2000 to 2020, a total of 21 years, with 378 observations due to each country being observed independently.

Table 4. 1: Descriptive Statistics

VARIABLES	OBS	MEAN	Std. Dev	Minimum	Maximum
RGDP	378	85636.44	203131.4	706.371	1300000
CPS	378	20.71795	18.46494	.449183	106.26
INP	378	4.84754	1.203316	2	7.7
FER	378	480.7297	809.8222	1	3727.07
CPI	378	2.738492	.8504679	1	5.9
REGIME	378	2.2857	1.19586	1	4

Source: Research Data, 2021

4.2.1 Economic Growth

Economic growth measured using GDP and over the study period had mean 85636.44 million USD. Its minimum value has been approximately 706.37 million USD while the maximum has been 1300000 million USD. This is an indication that over the years, some of COMESA countries have been on improving trend and has made a significant economic, structural, and political reforms that have driven and sustained its economic growth.

The small value of 706.371 million USD and a very large standard deviation of 203131.4 is an evident of huge deviations from the mean and means countries have had some development challenges such as poverty, inequality and climate change that have weakened private sector investment and are vulnerable to the economy.

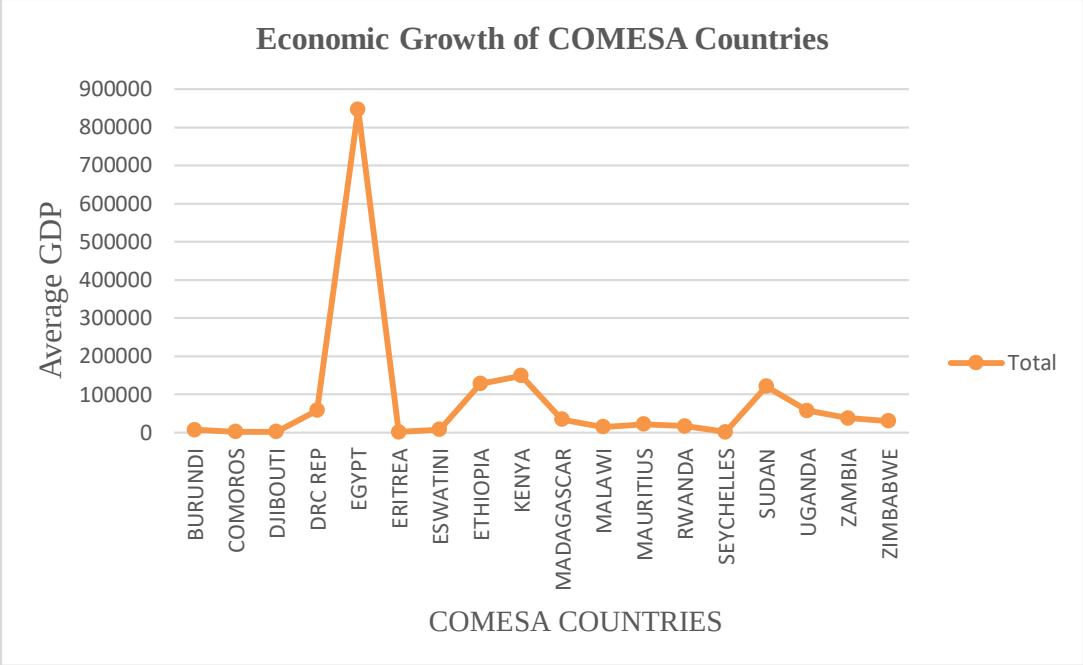

Figure 4. 1: Economic Growth of COMESA Countries

Source: Research Data, 2021

Figure 4.1 showed that countries that have had a low GDP compared to other COMESA counterparts are Comoros, Djibouti, Eritrea, and Seychelles while countries such as Kenya and Egypt have had the potential growth in GDP and the two countries have Africa's success stories from its growing youthful population, a dynamic private sector, highly skilled workforce, improved infrastructure, a new constitution, and their pivotal role in Africa.

4.2.2 Credit to Private Sector

Credit to the private sector is defined as the ratio of credit issued to the private sector of a country to its GDP, and it includes loans, trade credits, and other financial resources provided by financial corporations to the private sector (Kiriga, Chacha & Omanyo, 2020). Credit to the private sector had a mean of 20.71 and a standard deviation of 18.464 as shown in Table 4.1. The large variations from the mean indicate that certain nations have little credits to the private sector, while the minimum value is quite small (0.449), showing that some countries have a significant

credit to the private sector to their GDP (maximum value of 106.07). Figure 4.2 shows that countries like the Democratic Republic of Congo and Sudan have a high credit-to-private-sector-to-GDP ratio. Countries with a high CPS to GPD ratio include Mauritius, Egypt, Kenya, and the Seychelles. Private sector lending is an engine of economic growth in many economies because it efficiently allocates resources for investment (Nzomoi, Were, & Rutto, 2012).

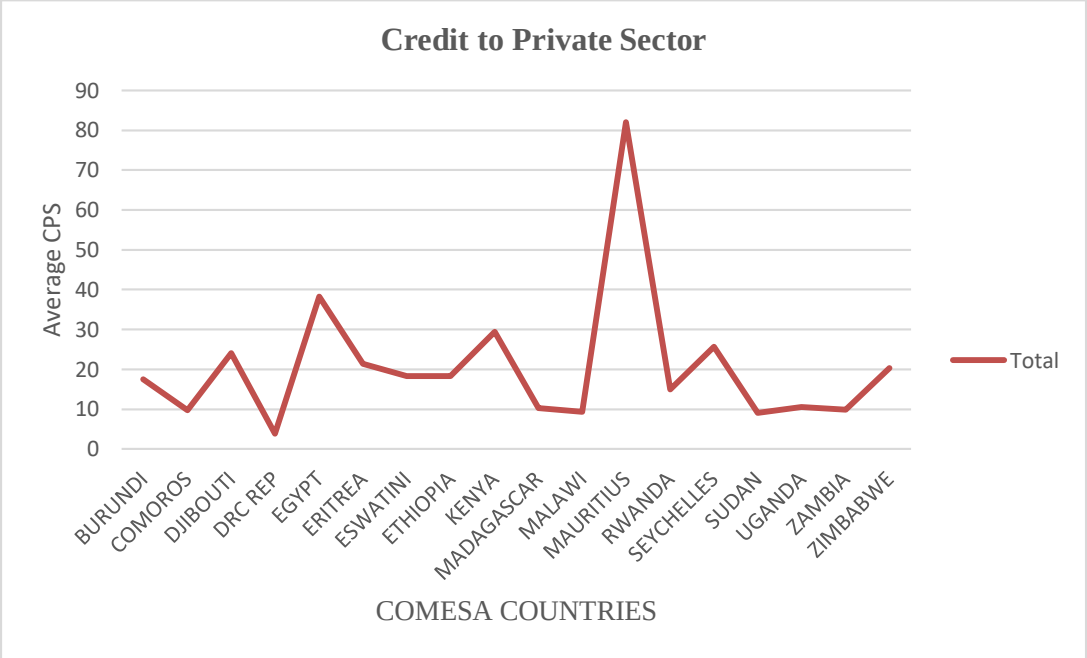

Figure 4. 2: Credit to Private Sector of COMESA Countries
Source: Research Data, 2021

4.2.3 Investor Protection

Investor protection was measured as the strength at which a country protects its investors. A mechanism that safeguards an investor's interests in the securities market or actions taken with the goal of bringing and maintaining transparency in procedural aspects when dealing with investors through some regulatory bodies and appropriate legislation (Chu et.al., 2017). Results analyzed showed that investor protection mean

was 4.848 and standard deviation of 1.203 with minimum and maximum value 2 and 7.7 respectively.

The value of investor protection ranges from 0-10 and a country with high investor protection have a value of 10. Values close to zero signifies weak investor protection. Standard deviation of 1.203 implies that values were close to the mean and that each COMESA country have an average investor protection. According to officially recognized international sources compiled by the World Bank. The index ranges from 0 (little to no investor protection) to 10 (greater investor protection). Figure 4.3 shows countries with a strong investor protection are Mauritius, Djibouti, and Rwanda whereas DRC, Sudan and Eswatini have weak investor protection in COMESA trading bloc.

Investor protection encompasses a variety of measures designed to protect investors from the poor performance of companies, merchant bankers, depository participants, and other intermediaries. It refers to mechanism that safeguards an investor's interests and actions taken with the goal of bringing and maintaining transparency in procedural aspects when dealing with investors through some regulatory bodies and appropriate legislation. Chu et.al., (2017) suggested countries should take steps to strengthen investor protection. Increased investor protection leads to better risk sharing, implying a higher demand for capital. Better investor protection implies higher interest rates because of a shift in demand.

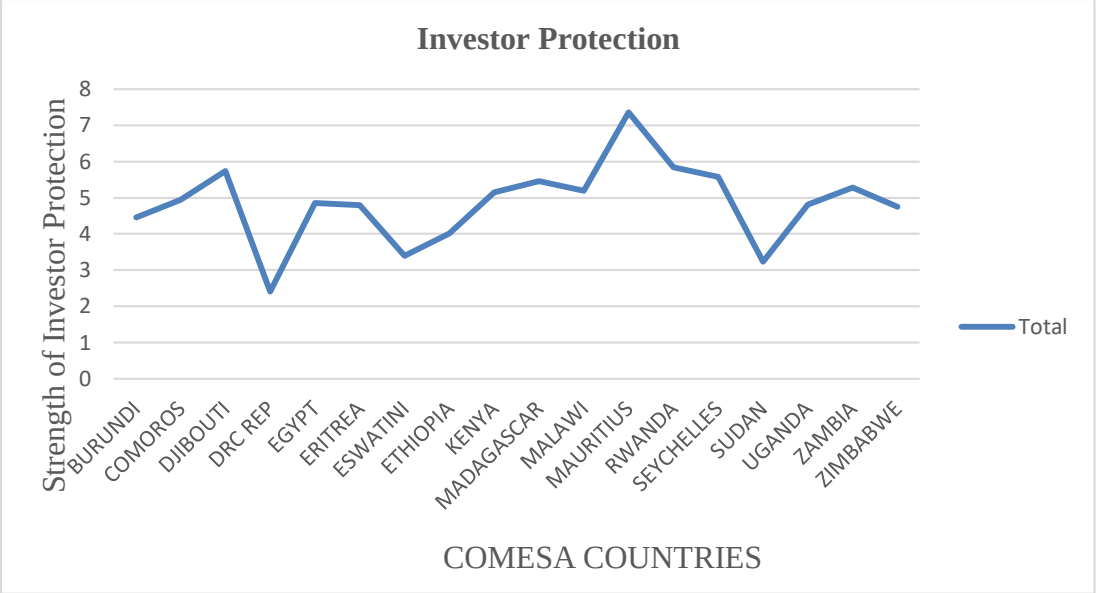

Figure 4. 3: Strength of Investor Protection

Source: Research Data, 2021

4.2.4 Foreign Exchange Rate

Foreign exchange rate in this study is a country's currency against USD. The average foreign exchange rate had 480.730 and high standard deviation of 809.822. The exchange rate or price of one country's currency in terms of someone else's currency is becoming increasingly important in any economy because it directly affects domestic price levels, the profitability of traded goods and services, resource allocation, and economic decisions. The exchange rate's stability is now a formidable bedrock of all economic activities.

Figure 4.4 shows that countries in COMESA trading bloc with weak currency against USD are Uganda, Madagascar, Burundi, DRC, and Rwanda. Some of the COMESA with different and strong currency against USD are Egypt, Eswatini, Ethiopia and Seychelles. Otieno and Mudaki (2011) explained that restriction to external shocks, a country requires appropriate policies both fiscal and monetary, it also requires implementation of an exchange rate system that is flexible to curb surfacing deficits in current account that cannot be sustained debt that is ever growing. The appreciation of

exchange rates has got policy makers and exporters often busy. There is need for a shift in the focus from these movements in exchange rates to measures that shield exporters against risks occasioned by these movements. An appropriate monetary and fiscal policies smoothen short-term capital inflows an reduces the effects of the movements of the local currency (Fritz & Prates, 2014).

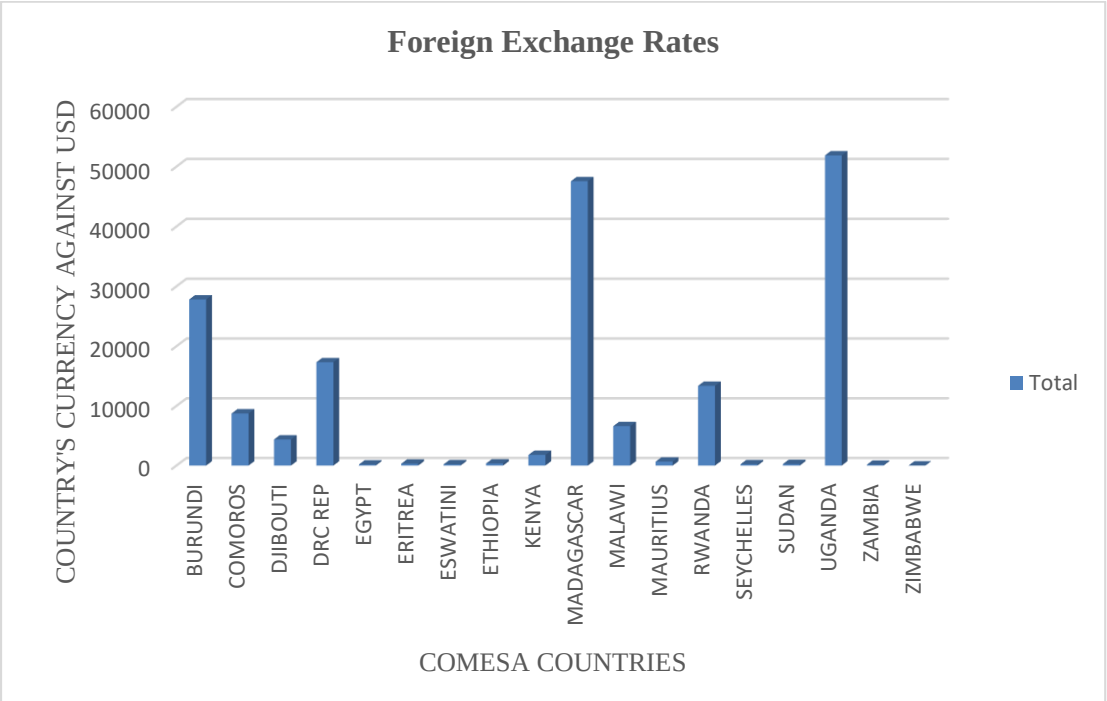

Figure 4. 4: Foreign Exchange Rate for COMESA Countries

Source: Research Data, 2021

4.2.5 Corruption Perception

The corruption perception has as a range from 0 to 10 with zero regarded as the highest level of corruption while 10 implies less corrupt. Table 4.1 indicates that COMESA countries have a mean corruption perception index of 2.7 with its deviation of 0.850 and it implies that majority of these countries trading in COMESA are corrupt. (Small standard deviation of the index from the mean). Though no perfect level of 10 and 0 for any countries, majority have high indexing to be corrupt. Figure 4.5 shows the prevalence of corruption across COMESA countries. These countries

are Sudan, Zimbabwe, DRC and Burundi, while Seychelles, Rwanda, Egypt and Kenya had low indexing compared to their counterparts in COMESA trading bloc.

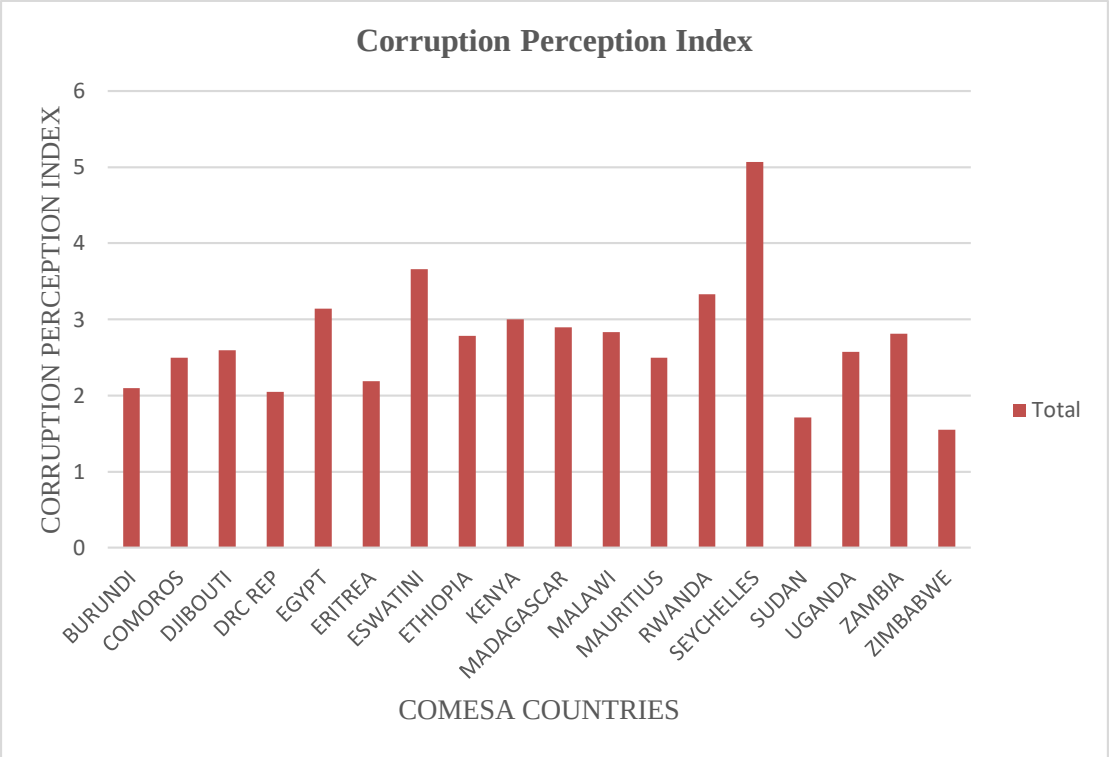

Figure 4. 5: Corruption Perception Index

Source: Research Data, 2021

The study suggests that corruption takes many forms and has an impact on service delivery, such as when a government official demands bribes to perform regular activities. Corruption unfairly influences how people get government contracts, with awards benefiting friends, relatives, and business acquaintances of government officials. It can also take the form of state capture, which alters how institutions work and who controls them, and is frequently the most expensive form of corruption in terms of overall economic impact. Each sort of corruption is serious, and addressing them all is essential for long-term progress and change.

Bribery, diversion of public funds, prevalence of officials using public office for private gain without facing consequences, lack of governments' ability to contain

corruption and enforce effective integrity mechanisms in the public sector, red tape, and excessive bureaucratic burden are all examples of corruption, according to Andvig et al., (2000). Corruption can be viewed as an economics organizational problem or as a cultural and human moral issue. Bribery involving a public servant and a transfer of tangible resources are two examples of corruption (Andvig et al., 2000).

4.2.6 Regime Change

Descriptive statistics presented in Table 4.1 show the average regime for the 18 COMESA countries from 2000-2020 was 2. It further indicates that there are some countries with only one regime and others have had 4 regimes. In this case, all the countries with one regime such as Eritrea, Eswatini, Seychelles, Sudan, Rwanda, and Uganda were put in the same category. Comoros, Egypt and Zimbabwe grouped together had two regimes whereas Kenya, Djibouti, Ethiopia and Zambia had at most three regimes. Other countries such as Madagascar, Malawi and Zambia had four regimes.

Figure 4.6 indicate how corruption correlates with regimes. Corruption varied with regime change. Countries with high number of regimes depicts high corruption whereas countries with less regimes had low corruption. For instance, DRC Rep, had at least 2 regimes showed a increase in corruption but Eswatini and Seychelles had only one regime and reported low corruption cases. However, in contrary to these statements, Sudan which had only one regime had high corruption index

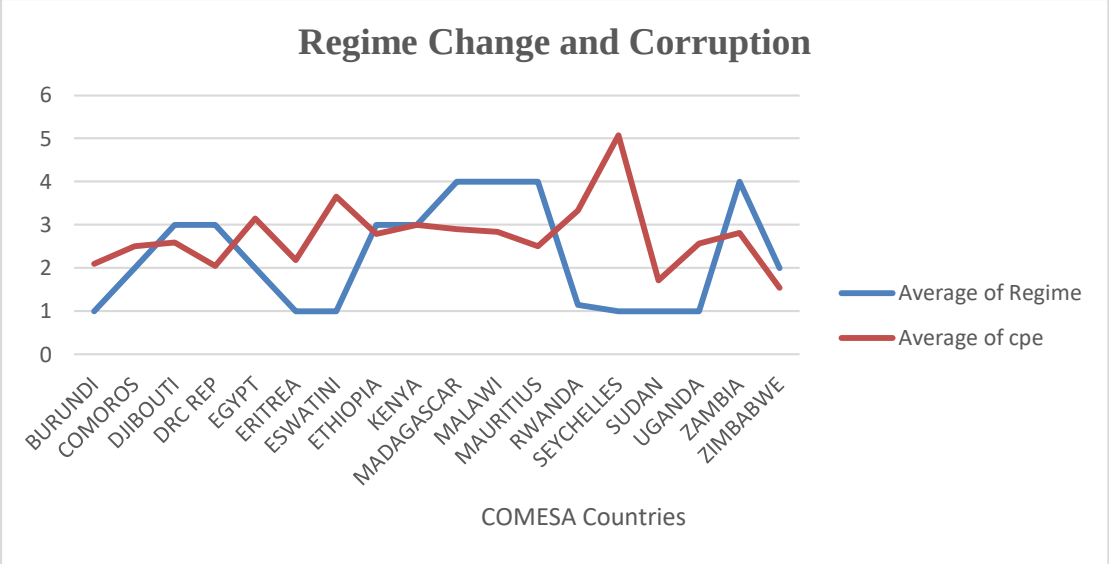

Figure 4. 6: Corruption versus Regime Change

4.3 Correlation Analysis

Table 4.2 shows results for Pearsons's correlation coefficient analysis. Correlation can be estimated using several techniques. Spearman ranks and Kendal coefficients can be used but this study used Pearson as it is widely used in both parametric and nonparametric and that the variables are near normal distribution; Pearson correlation is used where data have no significant outliers. The test presupposes that the variables have a linear connection and that the variables are quantifiable on a continuous scale. Correlation analysis gives an idea of how variables are related to one another, their direction and strength of their associations. There was a significant positive correlation ($\rho = .175$) between economic growth (GDP) and credit to private sector (CPS). Investor protection and economic growth had weak negative ($\rho = -.072$) though insignificant correlation.

Table 4. 2: Pearson Correlation Coefficients

	RGDP	CPS	INP	FER	CPI	Regime
RGDP	1.0000					
CPS	.1750* (.001)	1.0000				
INP	-.0720 (.163)	.5014* (.000)	1.0000			
FER	-.1322 (.010)	-.2612* (.000)	-.0028 (.957)	1.0000		
CPI	.0635 (.218)	.0650 (.207)	.2428* (.000)	-.1386* (.007)	1.0000	
Regime	-.0220 (.670)	.1919* (.000)	.2993* (.000)	-.0302 (.558)	-.0978 (.057)	1.000

Note: The values in () are the p-values. * Indicate significance at 5 percent level of significance
Source: Research Data, 2021

Foreign exchange to economic growth were negatively correlated ($\rho = -.132$). Credit to private sector and investor protection were positively correlated ($\rho = .501$). The relationship between the variables offers us an economic understanding of economic growth (GDP) in regard to these variables (the independent variables). It assists in discovering the main important aspects that influence a country's economic progress. This association also demonstrates the link between how economic growth disturbances are diffused and stabilized to be successful. Regime and economic growth have been negative ($\rho = -.022$). The correlation between foreign exchange rate and corruption on regime has been negative ($\rho = -..0302$) and ($\rho = -.0978$). A significant correlation has been between regime and credit to private sector ($\rho = .1919$), and regime and investor protection ($\rho = .2993$).

4.4 Data Preparation for Inferential Analysis

4.4.1 Unit root Tests

Two panel unit root tests were carried out. The Levin-Lin-Chu and Im – Pesaran - Shin Tests for Unit Root.

4.4.2 Levin-Lin-Chu and Im – Pesaran - Shin Tests for Unit Root

One of the main motivations for using unit root tests in cross-sectional units like countries is to minimize false regression, gain statistical power, and improve on the univariate counterparts' weak power (Breitung & Pesaran) (2008). The Levin-Lin – Chu test (2002) and the Im-Pesaran-Shin (2003) unit-root tests were used to look for unit root. The two tests (Levin-Lin-Chu and Im-Pesaran and Shin tests) assume that all of the panels have a unit root, as opposed to the alternative hypothesis that the panels are stationary.

The null and alternative hypotheses are explicitly stated in the header of each test's result. The exact specification of the test and dataset are summarized in the output header. Because there is no prior assumption on the amount of lags to be included, the Bartlett kernel estimates the long run variance of the variables using a maximum of 8 lags by default. In the model of the data-generating process, you can incorporate panel-specific means and time trends. The behavior of the number of panels, N, and time periods, T, required for the test statistic to have a well-defined asymptotic distribution is indicated by the asymptotic label.

The unadjusted t in the output is a conventional t statistic for testing H_0: $\emptyset = 0$. When the model does not include panel-specific means or trends, this test statistic has a standard normal limiting distribution and its p-value is shown in the output; the unadjusted statistic, t_{δ}^{*}, diverges to negative infinity if trends or panel-specific

constants are included, so a p-value is not displayed in those cases. From the output in Table 4.3 the Levin- Lin and Chu (LLC) bias-adjusted test statistic (t_δ^*) for CPS (credit to private sector) -9.6568 is significantly less than zero (p < 0.0000), so the null hypothesis was rejected the null hypothesis of a unit-root; that is, that $\emptyset = 0$ in favour of the alternative CPS is stationary (that is, that $\emptyset \neq 0$).

INP (investor protected) indicated a $t_\delta^* (-5.9613),\ p - value\ = 0.0000 < 0.05,$ therefore the null hypothesis was rejected. Foreign exchange rate (FER) also indicated a significant $t_\delta^* (-11.9448), p - value = 0.0000 < 0.05$ hence it was concluded that CPS is stationary at level. The LLC unit root test also showed that CPI (corruption perception) was stationary at levels since the adjusted t statistic, $t_\delta^* = -4.2658, \mathrm{p} - \mathrm{value} = 0.0000$ which rejects the null hypothesis of non-stationarity. RGDP real gross domestic product) also indicated that it is stationary at levels since$t_\delta^* = -9.6568, \mathrm{p} - \mathrm{value} = 0.0000.$

Table 4. 3: Levin-Lin-Chu and Im – Pesaran - Shin Tests for Unit Root

H_0: Panels contains unit root — Number of panels = 21

H_1: panels are stationary — Number of periods = 18

AR parameter: common — Asymptotic: N/T→ 0

LR variance: Bartlett kernel: 8.00 lags average (chosen by LLC and IPS)

Variable	**Levin –Lin- Chu – Test (Considers homogeneity of variance)**			**Im – Pesaran and Shin (Considers heterogeneity of variance)**				
	Unadjusted t	**Adjusted t***	**p-value**	**t – bar**	**t – tilde- bar**	**Z – t- bar**	**p-value**	**Remarks**
RGDP	-16.1952	-9.6568	0.0000	-4.1302	-2.9126	-9.2327	0.0000	Stationary
CPS	-14.8064	-7.6030	0.0000	-4.6976	-3.0790	-10.2324	0.0000	Stationary
INP	-12.6015	-5.9613	0.0000	-3.7752	-2.7814	-8.4444	0.0000	Stationary
FER	-20.2400	-11.9448	0.0000	-4.8335	-3.1208	-10.4846	0.0000	Stationary
CPI	-14.4953	-4.2658	0.0000	-4.2360	-2.9446	-9.4254	0.0000	Stationary

Notes: $Z_{\tilde{t}bar}$, is labeled Z-t-tilde-bar in the output and has an asymptotic standard distribution

Source: Research Data, 2021

Since LLC test imposes a common autoregressive parameter and for robustness, IPS (Im – Pesaran-Shin) was carried out. Similarly, IPS has the null hypothesis that all panels contain unit root while the alternative hypothesis that some panels are stationary. From the out, in Table 4.3, CPS the $p - value$ corresponding to Z-t-tilde-bar was significantly less than 0.05, hence, the null hypothesis was rejected. INP also registered a Z-t-tilde-bar of -8.4444 with $p - value = 0.0000 < 0.05$ which rejected the null hypothesis. FER indicated a Z-t-tilde-bar of -10.4846 with $p - value = 0.0000 < 0.05$ which rejected the null of unit root. Similarly, for CPI, the Z-t-tilde-bar was -9.4254 with $p - value = 0.0000 < 0.05$ implying the rejection of null hypothesis of presence of unit root. Finally, RGDP it was observed that the Z-t-tilde-bar was -9.2327 with $p - value = 0.0000 < 0.05$ and this led to the rejection of null hypothesis that some panels contain unit root. From the unit tests, it was concluded that the variables (CPS, INP, FER, CPI, RGDP) integrated of order zero, $I\ (0)$, hence, the variables were not transformed (differencing) before entering regression model.

4.5 Test for the Multivariate Linear Assumptions

In regression analysis, numerous key assumptions about the relationship between the independent variable and the result variable have been established. Before generating statistical judgments, the normality, multicollinearity, autocorrelation, and heteroskedasticity assumptions were checked on the data in this study.

4.5.1 Normality Test

According to Ernst & Albers (2017), the normality test is crucial because it examines the data distribution and helps to assess whether a random variable underlying the data sets is likely to be regularly distributed. The study used the histogram to plot the normality graphs after performing a skewness kurtosis test, as illustrated in Figure

4.7. Skewness and kurtosis are used in the normality test. Skewness assesses the symmetry of a random variable's probability distribution around its mean, whereas kurtosis measures the central peak in comparison to the typical bell curve. The goal of normality testing is to determine if the score distribution on the variables is normal; otherwise, the results will be unreliable. Skewness and Kurtosis values in a normal distribution are both far from zero(Jayaram & Baker, 2008)

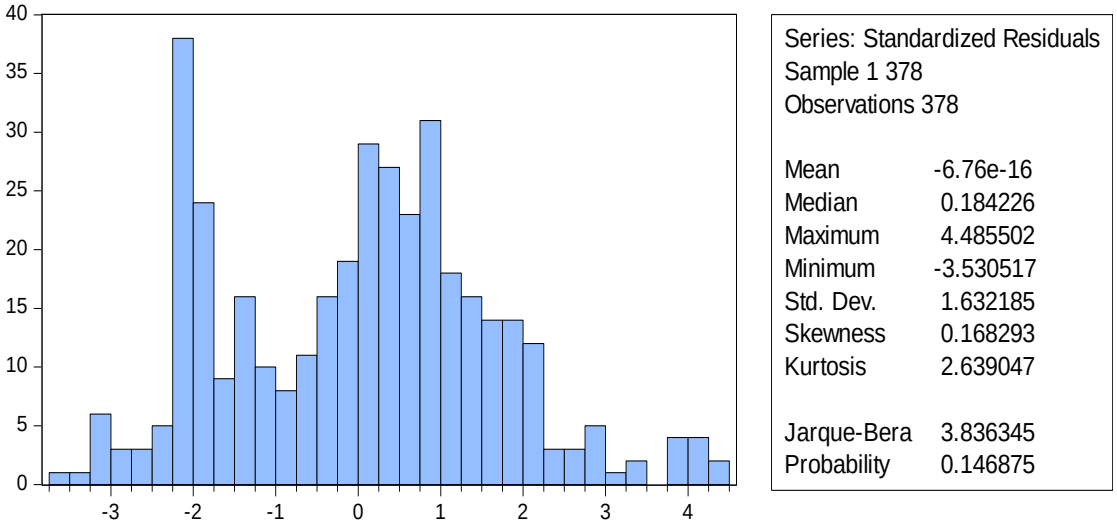

Figure 4. 7; Normality Test

Source: Researcher Analysis, 2021

The output indicates that the sampled data came from a normally distributed population, or that the data was normally distributed. The output has a mean of zero, variance of one (1), skewness of zero (0), and kurtosis of three, as expected from a regular normal distribution (3). For both skewness and kurtosis of the data, this indicates that the direction of distribution of variables around their means was asymptotically normal. It is observed that that the mean is$-6.36e-17 \cong 0$, skewness of 0.168 and kurtosis value of $2.639 \cong 3$. the value for Jarque-Bera which is a joint test is 3.836 and its probability of .1469 implying the null hypothesis that the data follows a normal distribution is accepted. Further, Figure 4.6 possesses the characteristic of belled shaped with rapidly decaying tails.

4.5.2 Multicollinearity Test

Table 4. 4: VIF Test for Multicollinearity Test

Variables	VIF	TOLERANCE (1/VIF)
CPS	1.49	0.6179
INP	1.47	0.6783
FER	1.13	0.8833
CPI	1.10	0.9094
Mean VIF	**1.30**	

Source: Researcher Analysis, 2021

Schofield (2015) opines that presence of multicollinearity among explanatory variables in a regression model is unacceptable since high correlation makes it difficult to determine the individual contribution of each of the independent variables to the dependent variable and potentially affect the estimates of regression coefficients and the statistical significance tests.

A multicollinearity test was undertaken to determine if two or more variables were highly correlated (not independent of each other) thus affecting the estimation of the regression parameters (Hair *et al.,* 2009). Presence of multicollinearity makes the assessment and hypothesis testing about regression coefficients unknown, which frustrate interpretations of the model coefficients (Gujarati, 2003), thus providing incorrect regression results (Palaniappan, 2017). Similarly, if the VIF is greater than 10 then there is multicollinearity problem (Stevens, 2009). Further VIF values greater than 10 confirm the presence of a collinear relationship (Nachtscheim, 2004). The study used VIF to check for multicollinearity among the explanatory variables.

Multicollinearity reduces the precision of the estimated coefficients because of inflated standard errors and weakens the statistical power of the regression model. Multicollinearity in panel data can be tested using Variance Inflation Factors (VIF).

CPS indicated a VIF of 1.49, INP a VIF of 1.47, FER; 1.13 and CPI; 1.10. The mean VIF is $1.30 < 10$ which indicates absence of multicollinearity. Mean VIF values less than 10 indicates no multicollinearity among the independent variables.

4.5.3 Heteroscedasticity

The main assumption in regression is that the variance of the error term is homoscedastic across all observations.

Table 4. 5: Breusch-Pagan / Cook-Weisberg test for Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for
Ho: Constant variance
Variables: fitted values of lngdp
chi2(1)= 0.07
Prob > chi2 = 0.7895

Source: Researcher Analysis, 2021

When heteroskedasticity is present, ordinary least squares estimators become biased and inconsistent, an inefficient, and when standard errors are inconsistent, invalidating statistical tests. (Breusch, T. S., and A. R. Pagan. 1979). The null hypothesis for Breusch-Pagan/ Cook-Weisberg test is that the is constant variance (variance is homogeneous). Results in Table 4.5 indicate probability of Chi2 of .07 is Prob > chi2= .7895 implying the null hypothesis failed to be rejected and therefore, null hypothesis of constant variance holds.

4.5.4 Autocorrelation (Serial Correlation)

The error terms become correlated when one of the Gauss-Markov assumptions fails, resulting in auto-correlation (also known as serial correlation). This can be caused by a number of errors, the most prevalent of which is the omission of a crucial variable

from the regression. The Durbin-Watson (DW) d statistic is used to test for first order autocorrelation. The serial correlation of errors in a regression model is determined via serial correlation analysis. The statistical test is invalidated if there is serial correlation between the residuals of subsequent years. This demands a test to see if a key variable was left out of the model or if one was included improperly. Table 4.6 reveals that the Durbin Watson value is 1.94, which is between 1.5 and 2.5, the Durbin and Watson criterion for no serial correlation (1950).

Table 4. 6: Autocorrelation (Serial Correlation) Results

Dependent Variable: LNGDP			
Method: Panel (random effects)			
Sample1: 378			
Periods included: 21			
Cross-sections included: 18			
Total panel (balanced) observations: 378			
Swamy and Arora estimator of component variances			
Cross-section random		0.073141	0.0016
Period random		1.754444	0.9287
Idiosyncratic random		0.480466	0.0697
F-statistic	5.239966		
Prob(F-statistic)	0.000408		
	Unweighted Statistics		
R-squared	0.015195	Mean dependent variable	9.905331
Sum squared residual	1122.529	Durbin-Watson statistic	**1.940961**

Source: Researcher Analysis, 2021

4.6 Panel Cointegration

Cointegration is a technique used to find a possible correlation between time series processes in the long term. This involved estimation of cointegration relationships between credit to private sector, strength of investor protection, foreign exchange rates and corruption among COMESA countries. The trace statistic and maximal

eigenvalues are utilized in the determination of Johansen Fisher panel cointegration in the cointegration test (Cameron and Trivedi, 2005). An Eigenvalue is a non-zero vector that changes by a scalar factor when a linear transformation is given to it. Trace tests evaluate the number of linear combinations in a time series data, whereas an Eigenvalue is defined as a non-zero vector that changes by a scalar factor when a Table 4.7 displayed cointegration test results using Johansen's maximum likelihood approach.

Table 4. 7: Johansen Fisher Panel Cointegration Test

Johansen Fisher Panel Cointegration Test

Series: lngdp cps inp fer CPI

Included observations: 378

Trend assumption: Linear deterministic trend

Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-eigen test)	Prob.
None	1019.	0.0000	713.1	0.0000
At most 1	437.4	0.0000	407.9	0.0000
At most 2	114.9	0.0000	88.83	0.0000
At most 3	59.68	0.0375	49.29	0.2045

* Probabilities are computed using asymptotic Chi-square distribution.

Source: Researcher Analysis, 2021

As evidenced by insignificance of probability, the test implies that there are only three cointegrating equations among the variables under investigation. The maximal eigen values are 2045. Since this probability is greater than .05, the null hypothesis of presence of cointegrating equations was accepted (at most three cointegrating equations) meaning there are 3 cointegrating equation between them. Cointegrating equations are equations used to adjust partial deviations from equilibrium. When variables are cointegrated, they are in long run relation to each other.

4.7 Model Estimation

There are a variety of methods for estimating panel data. Individual unique impact mistakes vary from one entity to the next while modeling a panel. Random effect refers to when these errors are supposed to be uncorrelated with the explanatory variables, whereas fixed effect refers to when they are allowed to be associated Greene, 2008). When it's suspected that the result variable is influenced by unobservable explanatory variables that are correlated with the observed explanatory variables, panel data regression models come in handy (Schmidheiny, 2014).

Panel data allows for the estimate of associations between two or more entities with time invariant and unobserved features. The only distinction between random and fixed effects is whether the unobserved individual characteristics effect contains aspects that are associated with the independent variables in the model (Greene, 2008). As a result of the alternative estimating mode, the study assessed both random and fixed effects, with the results shown in Table 4.8. The optimum model for assessing the research hypothesis was based on the recommendations of the Hausman test, which are discussed in the following section.

4.7.1 Model Selection Using Hausman Test

The study calculated both random and fixed effects. The Hausman test was used to display and compare the estimates. Jerry Hausman (1978) proposed the test, which compares two alternative estimates of model parameters, i.e. data that match to data created process, and checks for model misspecification. It compares coefficients based on specified criteria. The first property is that, under the null hypothesis of the right model specification, both estimates are compatible with the model's true parameters. The model estimates should have distinct probabilities limits as the second property. The test's power comes from this attribute.

The Hausman test results are shown in Table 4.8. The coefficients in the first column (fixed effects) and the second column (random effects) come from the random effect model. Hausman compares the null hypothesis of non-systematic coefficient differences (suited for random effects) to the alternative hypothesis of systematic coefficient differences (Fixed effects are appropriate). The Chi-square with 4 degrees of freedom has a value of 2.78 and a probability of Prob>chi2 =.5950, according to the data. The null hypothesis that the difference in coefficients is not systematic (random effect is adequate) was not rejected at the 5% level of significance, confirming that the estimates from the random effects regression model are sufficient in testing the hypotheses. When unobserved heterogeneity is consistent across time and not linked with independent variables, random effect models can help adjust for it. Because obtaining a first difference removes any time invariant components of the mode, this constant can be removed from longitudinal data using differencing.

Random effects extract more information from the data and better allocate variation in the model for a variety of reasons. The built-in safety feature is that if no true group level information or random effects are present, the random effects estimates will revert to fixed effects estimates (Gelman & Hill, 2006). Random effect estimation allows for inference about specific levels. This is sometimes referred to as exchangeability, which is the idea that the given levels in a random effect are typical levels from a greater collection of levels that may or may not be observed.

Table 4. 8: Hausman Test

Hausman Test				
	Coefficients			
Variables	**Fe (b)**	**Re (B)**	**(b-B) Difference**	**Sqrt(diag(V_b-V_B)) S. E**
CPS	.0253	.0267	-.0013	.0013
INP	-.4573	-.4569	-.0004	.0178
FER	.0003	.0003	-.00004	.00003
CPI	-.2092	-.2179	.0086	.0227

b = consistent under H_0 and H_a; obtained from panel regression

B = inconsistent under Ha, efficient under H_0; obtained from panel regression

Fe= Fixed Effects.

Re= Random Effects

Test: H0: difference in coefficients not systematic

Chi2(6) = (b-B)'[V_b-V_B)^(-1)](b-B)

=2.78

Prob>Chi2=.5950

Source: Researcher Analysis, 2021

4.7.2 Random Effects Results

The results of the Hausman test in the previous section suggested that a random effects model would be preferable to a fixed effect model. This influenced the use of random effects data in hypotheses testing. Individual unobserved heterogeneity is uncorrelated with the independent variables, according to the random effects assumption. The random effects estimator is more efficient than the fixed effects model if the random effects assumption holds. The R square, which is the coefficient of determination, measures the extent to which the independent factors influence the dependent variables, as shown in Table 4.9.

Since there was no unit root at levels (confirmed by Levin-Lin-Chu and Im-Pesaran-Shin tests), panel regression analysis was computed on the series in their levels. Results of regression analysis indicated that the modelled variables fitted the data very well as explained by Wald test statistic which uses Chi-square test is significant (Prob>Chi2=0.000<0.05).

Table 4. 9: Random Effects GLS Regression

Random Effects GLS Regression						
Group variable		Year				
				No. of Obs	= 378	
R- square		=.6174		No. of groups	= 18	
				Obs per group	= 21	
Corr(u_i, x)	=0 (assumed)			Wald chi2 (4)	= 50.33	
				Prob > chi2	.000	
LnGDP	**Coeff.**	**Std. err**	**Z**	**P |z|**	**[95% Conf. Interval]**	
CPS	.0267	.0056	4.77	.000	.0157	.0376
INP	-.4568	.0853	-5.36	.000	-.6240	-.2897
FER	.0003	.0001	2.87	.004	.0001	.0005
CPI	-.2179	.1042	-2.09	.037	-.4221	-.0136
Constant	12.0111	.4126	29.11	.000	11.2023	12.8198
Sigma_u	0					
Sigma_e	1.6697					
rho	0	(Fraction of variance due to u_i)				

Source: Researcher Analysis, 2021

This is a good indication since it points to a strong correlation which indicates that the explanatory variables jointly have a significant impact on the economic growth of COMESA countries. Further, the value for overall R square is 0.6174 in random effects estimation showing independent variables such as credit to private sector, strength of investor protection, foreign exchange rates and corruption explained at least 61.74% of the variation of the economic growth of 18 countries in COMESA trading bloc.

In this model, credit to private sector and foreign exchange rates positively and significantly influenced economic growth with respective coefficient and probabilities $\beta = .027, \mathrm{p} = .000$ and $\beta = .0003, \mathrm{p} = .004$. Strength of investor protection and corruption perception index negatively and significantly affected economic growth in COMESA trading bloc with $\beta = -.457, \mathrm{p} = .000$ and $\beta = -.218, \mathrm{p} = .037$.

The results for the direct effects can be fitted into an equation as

$$ECG_{it} = 12.011 + 0.027CPS_{it} - .457INP_{it} + .0003FER_{it} - .218CPE_{it}$$

4.8 Test of Hypotheses

The study has six objectives. These objectives are to establish the statistically significant influence of credit to private sector on economic growth among COMESA Countries. To evaluate the statistically significant effect of investor protection on economic growth among COMESA Countries. To investigate statistically significant of foreign exchange rates on economic growth in COMESA Countries. To establish whether corruption index has a significant influence on economic growth among COMESA Countries.

Furthermore, to test the moderating effect of corruption. Specifically, to find out the significant moderating role of corruption on the relationship between credit to private sector and economic growth among COMESA Countries. To investigate the significant moderating role of corruption on the relationship between investor protection and economic growth among COMESA Countries. To determine the significant moderating effect of corruption on the relationship between foreign exchange rate and economic growth in COMESA countries. Finally, to establish the cointegrating relationship between credit to private sector, investor protection, foreign exchange rate and economic growth in COMESA countries. They were hypothesized and tested as discussed in the subsequent section.

H_{01}: Credit to private sector does not statistically significant influences economic growth in COMESA

The first hypothesis concerned the effect of credit to private sector effect on economic growth. Results in Table 4.9 indicates that CPS positively ($\beta = .027$) and significantly ($p = .000 < 0.05$) affects economic growth of countries in COMESA. This means that the hypothesis was disproved, and it was determined that CPS has a positive impact on economic growth. Credit expansion to the private sector stimulates economic growth. This is because investors are prepared to put their money into higher-risk ventures while encouraging secure borrowers to be more efficient. A currency depreciation can lower the cost of exports while raising the cost of imports. Savings are channeled into productive investment through the financial sector, particularly in the formal economy. The banking industry is widely recognized as a vital channel for financial intermediation in the economy. Access to credit increases a company's productivity. Businesses and enterprises with sufficient financial resources

have a better chance of expanding. Several African economies, according to studies, are credit limited (Bigsten et al., 2000; Loening et al., 2008; Soderbom, 2000).

Financial institutions, according to Greenwood and Jovanovich (1990), produce better information, enhance resource allocation (through financing enterprises with cutting-edge technology), and hence encourage growth. Financial institutions, such as the banking industry, have also been claimed to be far better positioned to evaluate prospective entrepreneurs and, as a result, are more likely to fund the promising ones, boosting the likelihood of successful innovation and driving economic growth. Overall, providing key economic sectors with private sector credit has a great potential to support sectoral economic growth. The banking sector, which is the primary source of credit for the private sector, is an essential financial intermediation route via which financial resources can be mobilized for productive investment, which is required to achieve high economic growth.

H_{02}: Strength of Investor protection has no statistically significant effect on economic growth among COMESA countries.

The second objective was hypothesized as $\boldsymbol{H_{02}}$: Strength of investor protection has no statistically significant effect on economic growth among COMESA. Results indicate strength of investor protection negatively ($\beta = -.457, p = .000 < 0.05$) affected economic growth. This meant that the hypothesis was rejected, and that the COMESA economic bloc's countries had not adequately protected investors to drive economic growth. The findings refute the idea that investor protection improves economic growth by promoting equitable development, ethical lending, enforcement and dispute settlement, and recourse legislation. Countries with better investor safeguards grow faster than countries with weaker protections.

Protecting investors, according to the report, entails sharing risk that may occur and negatively impact their investment. The findings of the demand effect revealed that stronger protection raises interest rates and lowers investor income, lowering current savings and, as a result, limiting supply for the following period. The supply effect becomes stronger as capital flow restrictions get tighter. The analysis forecasts that nations with less limitations will have a higher positive benefit of investor protection on growth. A developing economy might entice investors who anticipate increased revenues and profits in the future. Increased output stimulates consumer demand and funds flow into the financial sector, allowing it to expand credit.

H_{03}: Foreign exchange rates do not have statistically significant effect on economic growth in COMESA Countries

The third hypothesis stated H_{03}: Foreign exchange rates do not have statistically significant effect on economic growth in COMESA Countries. Results indicated that foreign exchange rates had a positive and significant effect on economic growth ($\beta = .0003,\ p = .000 < 0.05$). the hypothesis was rejected and concluded that the alternative hypothesis holds. This means that a change in foreign exchange rates per unit boosts economic growth. These benefits can be explained by the fact that the overvalued official exchange rate helped importers by making them available on the domestic market at a cheaper price than they would have been at an equilibrium rate. Currency inconvertibility pressures and the inflationary effect of devaluation can both be mitigated by the foreign exchange rate.

The price of one country's currency in another country's currency is known as the exchange rate. It is a key aspect in determining the capital account since COMESA countries are too reliant on imported capital and intermediate foreign inputs. Some

loans are made in different currencies. As a result, the credit portfolio is more susceptible to currency fluctuations. Due to the necessity for international payments for international trade, capital movement, and interest rate repayment, the exchange rate between currencies varies from time to time. Exchange rate appreciation increases the return on investment in export output, whereas exchange rate depreciation decreases the return on investment, impacting credit demand.

As currencies decline in step with the dollar, items from nations whose currencies are tied to the dollar will become more competitive against those from other countries. This can enhance trade balances with other countries by increasing exports and decreasing imports. The currencies of countries with floating exchange rates, on the other hand, are likely to appreciate. Reduced import demand may be felt more immediately by trading partners. As a result, currency depreciation is sometimes a source of anxiety for trading partners. Furthermore, due to disparities in the items traded, certain countries' trade is more responsive to price competitiveness changes, while others are more sensitive to economic growth of trading partners. As a result, a currency depreciation may have varying consequences on trading partners.

The impact of currency exchange rates on goods trade, economic growth, capital flows, inflation, and interest rates is significant. Taking advantage of a weak dollar by investing in foreign shares. A weaker dollar can boost their US dollar gains. Investors should use securities like futures, forwards, and options to hedge their foreign currency risk. A lower currency makes imports more expensive, whereas a stronger currency boosts exports by making them more inexpensive to foreign customers. A weak or strong currency can affect a country's trade deficit or surplus over time. A stronger currency, on the other hand, might reduce international competitiveness and lower import prices, widening the trade deficit and finally weakening the currency in

a self-adjusting mechanism. However, an unduly strong currency may affect export-dependent sectors before this happens.

On the one hand, slight misalignment can lead to overvaluation periods in which a country's currency value is higher than it should be, implying lower competitiveness in comparison to trading partners. On the other hand, they may instead converge to undervaluation periods characterized by a lower currency value than expected, implying higher competitiveness margins in general. Exchange rate movements affect the amount of aggregate demand in an economy, and frequent significant fluctuations in the exchange rate can disrupt international trade and cause problems in a country's banking system. Monetary authorities, such as central banks, are concerned about the exchange rate for a variety of reasons. This contributes to an unsustainable trade balance and massive inflows of international financial capital, which could push the economy into a protracted recession if international investors decide to relocate their money elsewhere.

Furthermore, foreign commerce usually entails incurring production costs in one currency while earning revenue in another. As a result, exchange rate fluctuations can have a major impact on export and import incentives, as well as aggregate demand in the economy. This created a further incentive for exporters to sell items on the international market and convert their foreign exchange gains into domestic currency at a better swap rate than the official rate.

It's also worth noting that anchored exchange rates are linked to much better inflation results. Countries that undergo frequent parity adjustments while nominally retaining a peg are unlikely to reap the full benefits of a fixed exchange rate regime's anti-inflationary benefits. The exchange rate regime chosen has implications for economic

growth. Pegged rates are related with higher investment. However, they are linked to decreased productivity growth. On average, output growth is slightly weaker when exchange rates are pegged. Furthermore, because the nominal exchange rate cannot be used as an adjustment mechanism, growth is more variable. Finally, a country's exchange rate system is merely one part of its broader macroeconomic strategy. No regime can conceivably serve all countries at all times. For countries experiencing deflation, pegging the currency rate may be a valuable measure.

Currency prices are governed by supply and demand for money, which has replaced the fixed-rate system. This new structure is to blame for currency swings due to rapid variations in supply and demand driven by a range of external variables (Abor, 2005). Because of these swings, businesses are subject to foreign exchange risk. Furthermore, as economies open up and international trade expands, businesses become increasingly sensitive to variations in foreign exchange values. Changes in the real domestic currency value of assets, obligations, or operational revenues that are sensitive to unanticipated changes in exchange rates are known as foreign exchange exposures (Adler and Dumas, 1984). Changes in the exchange rate can induce a movement in stock values, directly for multinational corporations, exporting and importing enterprises, and firms that import a percentage of their inputs, and indirectly for other corporations, according to economic theory.

Exchange rate fluctuations affect the prices of imported completed items as well as the costs of imported inputs, affecting enterprises that compete indirectly (Grambovas and McLeay, 2006). Exchange rates can effect a company in a variety of ways: a company may create at home for both export and domestic sales, a country may make with imported and local components, and a company may produce the same or a different product at facilities abroad. All of these channels must be included in the

firm's model. The company mentioned below is a multinational corporation that employs both foreign and domestic labor and produces and sells both domestically and internationally.

H_{04}: Corruption has no statistically significant influence on economic growth in COMESA Countries.

From the random effects results it is shown that the coefficient of corruption perception was significant -.218 ($p - value = 0.037 < 0.05$. This implies that corruption negatively affects economic growth (RGDP). A one percent increase in corruption causes a 21.79 percent decreases in real gross domestic product (RGDP) among COMESA countries. Corruption is a barrier to RGDP growth at the macro level. Corruption undermines incentives and market processes, resulting in resource misallocation in the economy. Misallocation of resources can affect investment evaluations in two ways. First, it can influence the relative merits of projects. Changes in relative prices of goods and services, as well as resources and factors of production and entrepreneurship, are all influenced by corruption. Second, there is misallocation of resources when decisions are made on how public funds should be allocated.

Because the decision makers may consider potential corrupt payments, a misallocation is possible. Increased corruption works as an ineffective tax on businesses, increasing production costs and reducing firm profitability. Another method corruption stifles economic growth is through the investment channel. Bribery in the public sector is one form of corruption. This discourages investment because it may produce public unrest and unhappiness, which discourages or negatively affects economic output.

Corruption erodes public trust as well as the social compact. Corruption generates and maintains the disparities and discontent that contribute to fragility, violent extremism, and conflict all across the world, but especially in fragile and violent environments. Investment is stifled by corruption, which has a detrimental influence on economy and employment creation. Corruption-fighting countries make better use of their people and financial resources, attract more investment, and grow more quickly.

Economic growth (Real GDP) is high for countries with high investment to real gross domestic product, according to Song, Chang, and Gong (2021). Corruption can also affect government responsibilities and shift resources from public to private reasons, resulting in a deadweight loss for the country. They argue that corruption alters government aims and diverts resources from public to private ends, resulting in a societal deadweight loss, supporting the'sand the wheels concept.' The conclusions of this investigation support Mo's earlier findings (2001).

4.8.1 Test for Moderating Role of Corruption

The study tested for moderating effect of corruption on the linkage between credit to private sector, strength of investor protection and foreign exchange and economic growth. It adopted the Hayes model. A multiple regression was used in testing moderation as suggested by Hayes, (2017). Moderation analysis was don on each of the explanatory variables on their effects on economic growth. Results were presented using tables and a graph. Each of the independent variable was moderated with corruption and tested. These hypotheses are $\boldsymbol{H_{05a}}$: There is no moderating role of corruption on the relationship between credit to private sector and economic growth in COMESA countries. $\boldsymbol{H_{05b}}$: Corruption does not have a significant moderating role on the relationship between investor protection and economic growth in COMESA countries. $\boldsymbol{H_{05c}}$: Corruption does not moderate the relationship between foreign

exchange rate and economic growth in COMESA countries. Transparency International's Perception of Corruption Index was reversed to quantify corruption (CPI). Transparency International compiles data from a variety of sources to generate perceptions on the amount of corruption in the public sector from businessmen and country experts (Transparency International 2019).

Table 4. 10: Moderating Role of Corruption

	Moderation 1			**Moderation 2**			**Moderation 3**		
Variables	**Coef.**	**SE**	**Sig**	**Coef.**	**SE**	**Sig**	**Coef.**	**SE**	**Sig**
Constant	11.137	.539	.000	9.888	.875	.000	11.378	.322	.000
CPI	-1.095	.328	.007	1.297	.695	.063	-.650	.277	.020
CPS	-.186	.187	.316	-	-	-	-	-	-
INP	-	-	-	.430	.586	.464	-	-	-
FER	-	-	-	-	-	-	-.304	.056	.000
CPS*CPI	.006	.003	.69	-	-	-	-	-	-
INP*CPI	-	-	-	-.140	.048	.004	-	-	-
FER*CPI	-	-	-	-	-	-	.0003	.000	.000
R-square		.564			.565			.573	
Adj-R-square		.560			.562			.570	
R-square change		.002			.001			.004	
F-statistic		3.772			8.843			13.694	
P>F		.011			.000			.000	

Source: Researcher Analysis, 2021

Results in Table 4.10 shows that there were three models for testing moderation. The first moderation was on the link between credit to private sector and economic growth. The second explains corruption moderation on the relationship between investor protection and economic growth whereas the third entails moderating effects on foreign exchange rate and economic growth of countries in COMESA economic bloc. The significance of F-statistic is all significant at 5 percent level across the

models and it explains the model fitness. R-square change is high on the third model. It explains that foreign exchange rate and corruption explains economic growth than the investor protection and credit to private sector

Testing the Moderating Role of Corruption on the Relationship between Credit to Private Sector and Economic Growth

The role of a moderator as explained by Hayes (2012) is either to strengthen or weaken the relationship between the independent variable and the dependent variable. Moderation analysis is used when testing whether the magnitude of a variable's effect on some outcome variable of interest is dependent on a third variable or set of variables. The first moderation was on credit to private sector and economic growth. It stated as follows $\boldsymbol{H_{05a}}$: There is no statistically significant moderating role of corruption index on the relationship between credit to private sector and economic growth in COMESA countries. Results in Table 4.10 shows corruption negatively and significant to influence economic growth. Thus, the hypothesis $\boldsymbol{H_{05a}}$ was rejected. The relatively simple moderation model is depicted conceptually in Figure 4.8. In this form, CPS is shown to have a causal influence on GDP, as indicated by the unidirectional arrow pointing from CPS to GDP.

However, CPI is proposed to influence or moderate this effect, hence the arrow pointing from CPS*CPI to the arrow pointing to GDP. Results indicates that credit to private sector positively though insignificantly affects economic growth ($\beta = .186, p = .316$) while corrupt had a negative and significant relationship on the economic growth ($\beta = -1.095, p = .007 < .05$). The interaction term CPS*CPI showed a positive effect to GDP. The study proposes that those financial resources

should target financial reforms that boosts development in the financial sector to increase economic growth.

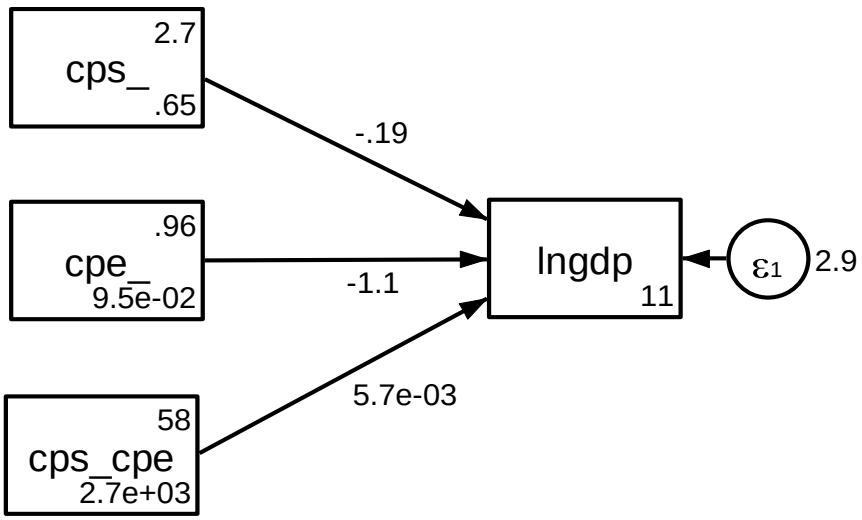

Figure 4. 8: Moderation of Corruption (CPI) on CPS and RGDP

Source: Researcher Analysis, 2021

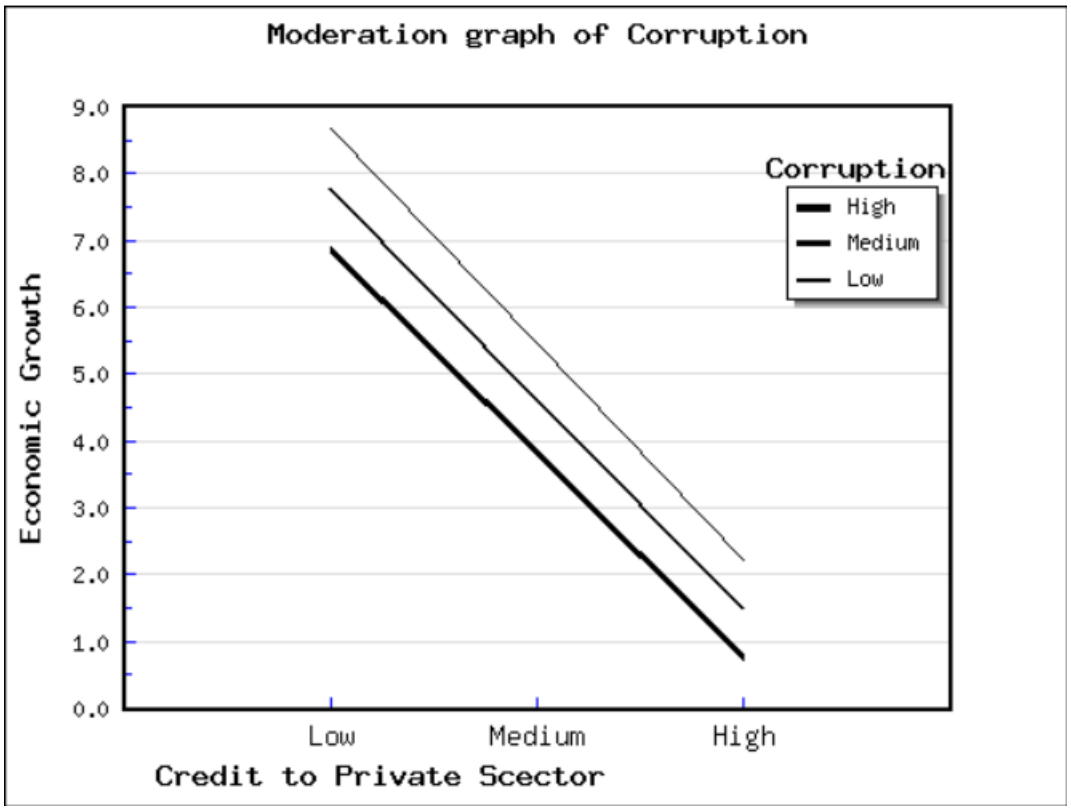

Figure 4. 9: Moderating Role of Corruption on Relationship between Credit to Private Sector and Economic Growth

Figure 4.9 presents the moderation graph of corruption on the relationship between credit to private sector and economic growth in COMESA countries. The graph signifies that there is a difference when corruption is low or medium or high. When corruption is high in accessing credit in private is detrimental. They argue that corruption alters government aims and diverts resources from public to private ends, resulting in a societal deadweight loss, supporting the sand the wheels concept.' The conclusions of this investigation support Mo's earlier findings (2001). This study's findings contradict previous findings. Theoretical projections about the impact of corruption on economic growth are equivocal. The "grease the wheels" concept claims that corruption boosts economic growth, while the "sand the wheels" hypothesis claims that corruption slows it down. While the 'efficient grease' hypothesis claims that corruption improves economic efficiency by acting as a lubricant that minimizes delays and transaction costs, and hence leads to better outcomes.

Furthermore, the findings of the study agree with those of Hefeker (2010) and Huang and Wei (2006), who found that corruption can influence economic growth, or, more precisely, that corruption can have a positive or negative impact on economic growth. Several explanations have been offered to support the research findings that the relationship between corruption and growth has a direct negative impact. This can be explained by a negative impact on investment, a decrease in the efficiency of government expenditures (Del Monte and Papagni, 2001), or mismanagement (Blackburn and Forgues-Puccio, 2007).

The idea that corruption has a beneficial impact on output has a simple explanation. Businesses can employ corruption, defined as a lack of institutional quality, to avoid paying taxes. Corruption can be utilized to compensate for the distortion generated by

the tax burden because taxes are distortive. The idea of "efficient corruption" isn't a new one. As a result, corruption is perceived as "grease money" that may be used to grease the wheels of trade or authoritarian authority (Coppier and Michetti, 2006; Kaufmann and Wei, 1999). According to Barreto (2000), the efficiency-enhancing effect of corruption stems from the fact that it can eliminate bureaucratic red tape.

Several mechanisms have been found via which corruption may have a positive impact on growth in general. If existing government regulations and processes are damaging to economic growth, or if their tardy execution causes transactions to be delayed, diminishing efficiency (Batabyal and Yoo, 2007), evading them through corruption may be beneficial. Rather than allowing corruption, which always has bad consequences for public trust in government and legitimacy, as well as negative consequences for income distribution, the ideal policy reaction would be to eliminate or change ineffective rules.

Testing the Moderating Role of Corruption on the Relationship between Strength of Investor Protection and Economic Growth

The direct effect of investor protection on economic growth was observed to be negative in COMESA trading bloc. The study further investigated what role corruption has played on this relation and the findings showed. Moderation implies that the causal effect may be weakened, amplified, or reversed (Judd & Kenny, 2010). Moderation analysis is used when one is interested in testing whether the magnitude of a variable’s effect on some outcome variable of interest depends on a third variable or set of variables. The statistical model takes the form of a linear equation (Jaccard & Turrisi, 2003) in which dependent variable is estimated as a weighted function of independent and the moderator and, most typically, the product of the independent

and moderating variable. The second moderation was on the relationship between strength of investor protection and economic growth. Results presented by Table 4.10 and Figure 4.10 indicate that investor protection and economic growth have a positive and insignificant relation ($\beta = .430, p = .464$) whereas the moderated term INP*CPI was negative and significant ($\beta = -.140, p = .004$) implying that corruption alters the relationship, and this relation causes negative economic growth. Therefore, the $\boldsymbol{H_{05b}}$: Corruption does not have a significant moderating role on the relationship between investor protection and economic growth in COMESA countries was rejected and alternative hypothesis accepted.

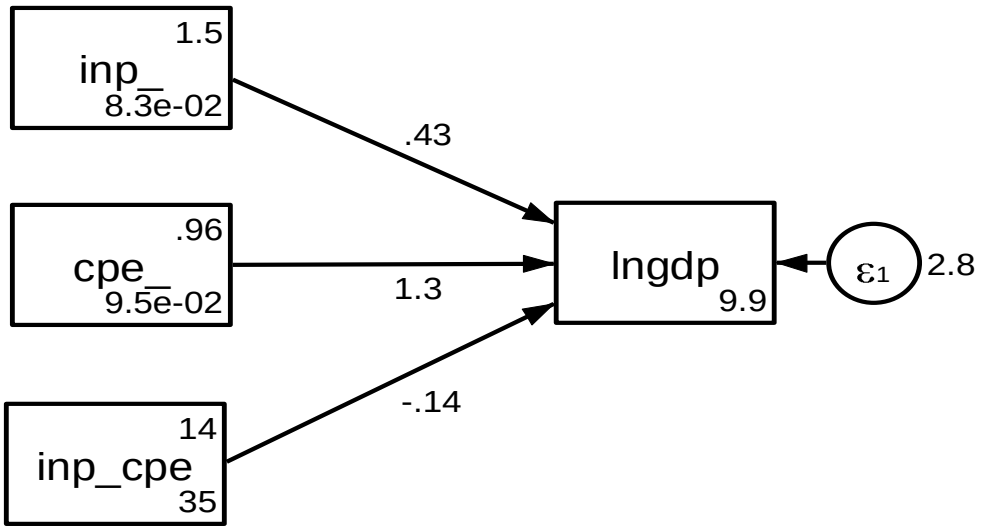

Figure 4. 10: Moderation of Corruption (CPI) on INP and RGDP

Source: Researcher Analysis, 2021

Figure 4.11 indicates that when investor protection is high, economic growth is high given the condition that corruption level is low. Further, the figure show a decreasing effects of economic growth when corruption level is high. Investors in industrialized countries, as opposed to emerging markets, have more confidence because of high transparency and little corruption, which reduces volatility. The data, taken collectively, show that investors are concerned about a country's level of protection, openness, and legal content and enforcement. Expropriation is on the rise in many

nations, therefore protecting all stakeholders through legal standards is vital for the evolution of a capital market. As a result, investor protection through the legal system (both law and enforcement) is a collection of procedures that safeguard outside investors from insider expropriation. Civil law is connected with more state interference in financial market activity and less protection for minority investors than common law and lenders.

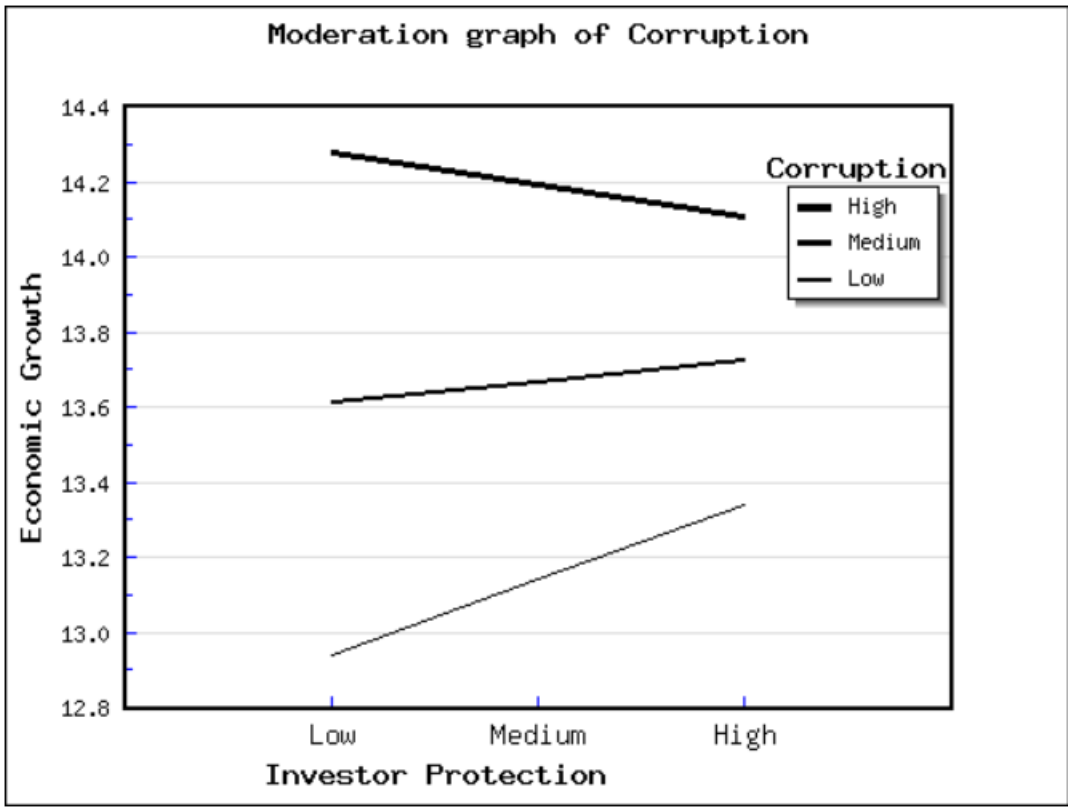

Figure 4. 11: Moderating Role of Corruption on Relationship between Investor Protection and Economic Growth

In addition to the relevance of the country of legal origin and investor protection, corruption appears to be another key source of uncertainty in the stability of a financial system. Transparency International defines corruption as "the abuse of entrusted power for personal gain." Both public and state-level corruption are included in this classification. Countries that place a high importance on transparency are less likely to be corrupt, lowering ex-ante uncertainty and volatility in the stock

market. The findings, on the other hand, demonstrate that corruption deters private investment, meaning that corruption boosts corporate costs while heightening uncertainty about the future. The findings back up Rajagopalan, Sundarasen, and Rajangam, N. (2014) in their assertion that corruption stifles progress and that institutional reforms to improve governance quality are required to achieve investment-led growth.

Corruption also reduces the quantity and quality of public investment, slowing growth. Corruption affects the efficiency of public investment decisions by creating a preference for large projects with large private gains for policymakers. Indeed, the evidence in this study contradicts the hypothesis that government spending and corruption are linked (Ndikumana 2007).

Combating domestic and foreign bribery and building transparent and accountable public institutions boosts investment and competition while also enhancing public sector integrity, government efficiency, and entrepreneurship, according to the findings. Further study and analysis in COMESA countries will reveal where and how corruption has damaged economic performance, as well as how policy goals and reforms may be more clearly articulated. This would also address the challenge of evaluating progress and quantifying the impact of anti-corruption policies, which is now hindering many governments from taking more decisive, consistent, and long-term action in this area.

As a consequence of this research, it is obvious that robust and systematic implementation of the various aspects of the anticorruption agenda is essential to address corruption's influence on multiple transmission channels, and hence on long-term economic growth. Most crucially, corruption erodes public confidence in

government, making it more difficult for it to fulfill its fundamental duty of delivering appropriate public services and promoting a favorable environment for private sector development.

Although corruption does not directly effect economic growth, it does so through a number of transmission mechanisms that have been well investigated. They take into account the consequences of (indirect) corruption on output and growth rates. Corruption tends to lower the level of corporate investment by diminishing its profitability and creating uncertainty, which is the most widely researched transmission channel. Corruption has a considerable impact on economic performance because it influences the number and character of government expenditures and revenues, subject to existing tax laws and earnings.

By lowering both direct and indirect tax collections, corruption jeopardizes the public sector's ability to offer enough levels of public goods to allow private-sector development. Diverting resources from human capital building (health and education) to less capacity-enhancing activities reduces a country's growth potential on the expenditure side. Corruption has a particularly severe influence on ongoing poverty alleviation projects in low-income nations, according to several studies such as Ndikumana (2007) and Sturm, P. (2013). Corruption in the form of bribes for processing appropriate requests will increase the cost of investment when private sector investment is subject to government regulation (Bardhan,1997). As a result, its profitability suffers, as does the overall volume of private investment. To avoid paying a bribe, it may result in investment being diverted to less productive initiatives (and/or the firm migrating to the informal sector), implying a sub-optimal resource allocation.

Testing the Moderating Role of Corruption on the Relationship between Foreign Exchange Rate and Economic Growth

The last moderation of corruption was tested on foreign exchange rates and economic growth. This hypothesis stated that $\boldsymbol{H_{05c}}$: Corruption does not moderate the relationship between foreign exchange rate and economic growth in COMESA countries. As per the results and findings of the study, foreign exchange rate positively and significantly ($\beta = -.304, p = .000$) affected economic growth of countries in COMESA trading bloc. On the other hand, the interaction term (FER*CPI) which measured the moderation effect was found to be positive ()$\beta =$ .0003 and significant at 5 percent significance level ($p = .000$). Thus, hypothesis $\boldsymbol{H_{05c}}$ was rejected. Because of this positive significance of corruption (though in a small percentage due to the magnitude of coefficient $\beta = .0003$ see Figure 4.12), According to the study, if corruption has a good influence on economic growth, a tight peg system can lead to more tolerated corruption, meaning that if corruption has a considerable positive effect, the distortive impact of taxation is relatively minimal. If, on the other hand, corruption has a dual negative effect, exchange rate pegging will result in less acceptable corruption, as well as higher taxes and less government spending.

According to (Aidt, 2003), corruption is another significant feature economies, which includes, among other things, rent seeking behavior by bureaucrats, the weakness of public institutions, bribery, and even state dysfunctions. While corruption has a variety of consequences, one of the most obvious is a deterioration in the government's budget, Corruption, in other words, has an impact on budgetary policy. Because monetary policy (in the form of exchange rate regimes) is in some ways

interwoven into fiscal policy, it is reasonable to conclude that corruption and the acceptability of specific exchange rate regimes are linked (Junejo, Sohu & Hussin, 2019).

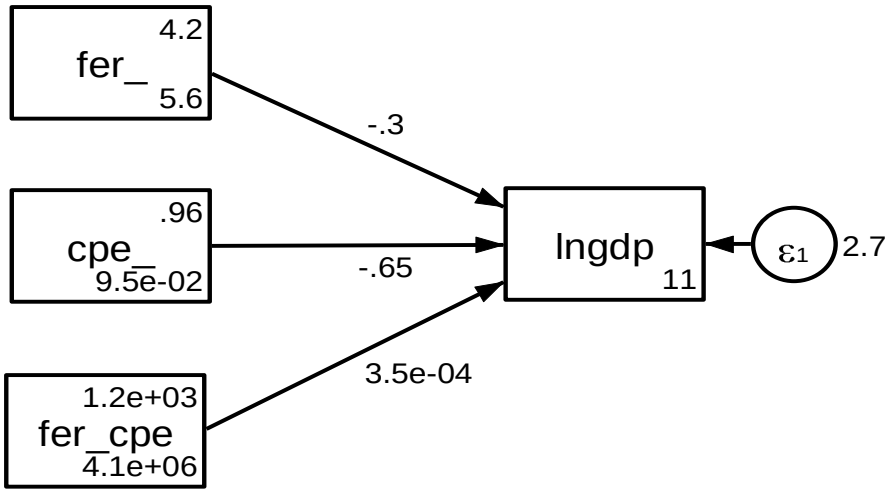

Figure 4. 12: Moderation of Corruption (CPI) on FER and RGDP

Source: Researcher Analysis, 2021

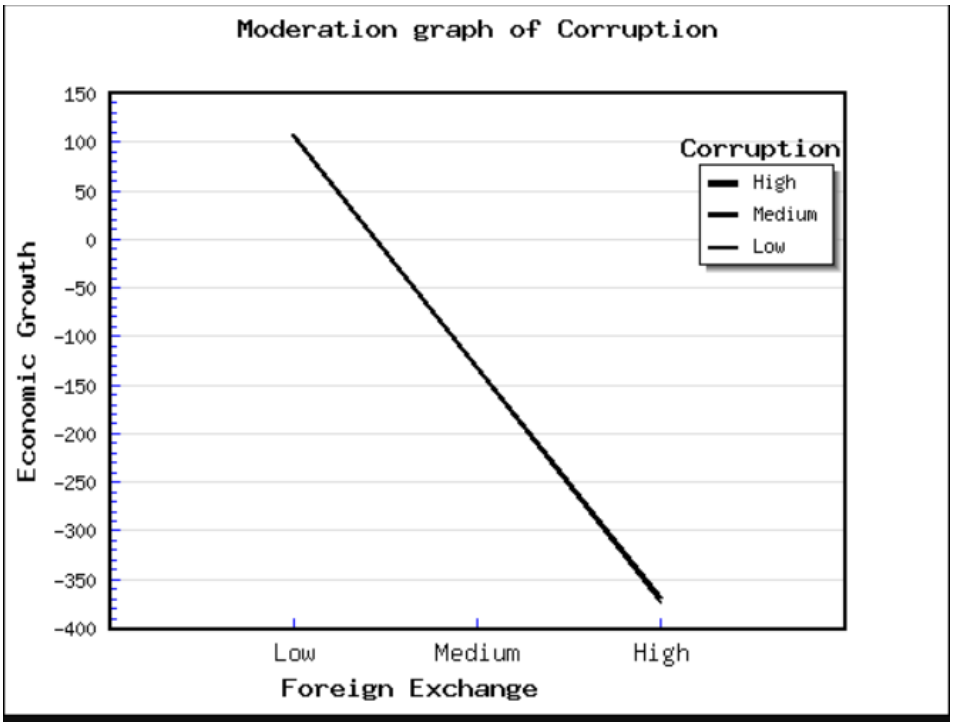

Figure 4.13: Moderating Role of Corruption on the Relationship between Foreign Exchange Rate and Economic Growth

The moderation graph of corruption on the relationship between foreign exchange rate and economic growth presented by Figure 4.13 indicate no difference between low, medium and high impact of corruption on exchange rate. High foreign exchange rate decelerates economic growth. Another important contribution made by this study, which backs up Huang and Wei (2006)'s findings, is that corruption is seen as a source of tax evasion, lowering fiscal capacity. However, the impact of corruption on monetary regime choice has hitherto been understudied, with only a few techniques addressing the issue. On the other side, Hefeker (2010) claims that pegging to a stable currency can prevent corruption. He also contends that monetary unity has uncertain implications. Hefeker combines Huang and Wei (2006) and De Kock and Grilli (2006) in his study (2006). By evaluating the impact of a country's currency rate regime on the level of condoned corruption, the study contributes to knowledge. It is the basic framework for influencing people's perceptions of corruption's function. Corruption's sole effect on the economy is a worsening of the public budget is not without value, and corruption can have a positive or negative impact on economic growth. While many researchers argue that poor institutions are linked to slow economic growth (Olson et al., 2000), a large body of evidence suggests that a lack of institutional quality can actually lead to an increase in economic activity (Coppier and Michetti, 2006; Barreto, 2000; Méon and Sekkat, 2008). The notion of "efficiency enhancing corruption" as a second-best remedy in response to market or governmental failures might be incorporated in the study. As a result, the researcher's contribution is distinct from past research.

Economic growth will fall if the negative impact of corruption on growth is not significant. According to Hefeker (2010), a fixed peg system, while beneficial in terms of monetary credibility, might also be harmful in terms of increased permitted

corruption. In terms of the government's currency rate regime selection, it is discovered that if corruption has a substantial positive impact on output, a fixed peg regime will be chosen. The government will be expected to keep its currency futures if this does not happen.

The autonomous monetary regime is widely criticized as being suboptimal for developing and transition countries due to monetary policy credibility concerns. Given these countries' high levels of corruption, it seems reasonable to adopt a different monetary policy approach, such as an exchange rate peg (Calvo and Reinhard, 2002; Keller and Richardson, 2003). Tight peg regimes, such as a currency board or dollarization, generate better confidence than intermediate types, according to Hefeker.

Corruption, a lack of transparency, and excessive borrowing are regarded to be the main drivers of the exchange rate decline. According to Wei and Wu (2001), corruption can change a country's structural composition of capital inflows, resulting in an internal currency crisis that can be aggravated by a rapid reversal in international capital flows. According to Ghosh and Ghosh (2002), nations with inadequate public sector governance are more prone to have exchange rate crises. As a result, a fluctuating exchange rate impacts not only a single country's economy, but also the entire region or, at the very least, other members of the same trade organization.

In many developing and developed countries, corruption has been an ubiquitous phenomena, coexisting with increasing rates of inflation and expansive spending policies. Corruption is just one symptom of a failing institution. High levels of corruption and lease chasing are common features of corruption in other resource-rich

countries. However, research on a separate subject found evidence of an inverted association between the exchange rate and corruption (Hussain, Sabir, & Meo, 2017).

Testing the cointegrating relationship between credit-to-private sector, investor protection, foreign exchange rate, corruption perception and economic growth in COMESA countries.

The sixth and final objective of the study was to find out whether the relationship between effect of credit-to-private sector, investor protection, foreign exchange rate, corruption perception and economic growth in COMESA countries was either short run or long run. The objective was tested using Johansen Multivariate Co-Integration technique for panel data. The hypothesis stated as $\boldsymbol{H_{06}}$: There is no cointegrating relationship between credit-to-private sector, investor protection, foreign exchange rate, corruption perception and economic growth in COMESA countries. Results for Johansen's test indicates there are at most 3 cointegrating equations. According to Johansen and Søren (1989), Cameron and Trivedi, (2005), long run relation exists.

The study explains that if the amount of credit extended to the private sector by banks of respective countries in COMESA region is regarded as an important factor in determining a country's level of financial development. Credit extended by banks to the private sector is thought to be a more efficient way of supporting economic development than credit extended to the public sector in the long run (has exhibited by cointegrating relationship). This is in line with the findings of Okoth, 2018), that countries where the government, through the public sector, dominates credit receipt, the private sector has difficulty funding its investments through credit.

The financial sector's stability is critical to any country's economic development. The literature shows that there is a link between economic growth and the credit market.

Increased capital allocation accelerates growth, resulting in long-run economic growth. As a result, the financial sector and economic development are inextricably linked. Following the economic crisis, the banking sector was subjected to a reforming process with the goal of making the sector safer and assisting it in resuming its core objective of financing the real economy (Duican & Pop, 2015).

The long run effect of strength of investor protection can be explained in two ways the strength of supply effect and demand effect as suggested by Castro, Clementi, and MacDonald (2004). The strength of the supply effect, and thus the sign of the net effect of investor protection on growth, is determined by capital mobility across borders. In a closed economy, the supply effect is most powerful. the supply effect, is a general equilibrium effect that suggests a negative association between investor protection and economic growth in the long run. Better investor protection may even result in a lower growth rate and lower steady-state capital and output. At the other end of the spectrum, in a small economy with no restrictions on capital flows, the interest rate is determined by global capital markets. As a result, the supply effect vanishes. The demand effect lends support to a positive relationship between investor protection and growth. Better risk sharing results from improved investor protection. Better risk sharing implies a higher demand for capital at any given interest rate, as in any partial equilibrium model of investment with risk-averse entrepreneurs.

The findings also suggest that while increased foreign exchange reserves may reduce consumption, they can also boost investment and economic growth. However, when we control the impact through investment, the positive impact on economic growth vanishes. A stronger currency, on the other hand, can reduce export competitiveness and make imports cheaper, causing the trade deficit to widen further and eventually

weakening the currency in a self-adjusting mechanism. However, before this occurs, export-dependent industries may be harmed by an overly strong currency.

According to the findings of Sibanda, (2012), currency undervaluation significantly hinders growth in the long run while significantly enhancing economic growth in the short run. As a result, depreciating the currency to achieve higher growth rates is only effective in the short run and is not sustainable in the long run. Based on the study's findings, the researcher advised that currency misalignment (overvaluation and undervaluation) be avoided at all costs.

Corruption has existed for a long time and will continue to exist in the future unless governments find effective ways to combat it. This is not going to be an easy task. Although economics has a long history of studying the causes and consequences of corruption. It has been clearly demonstrated that if corruption has a positive effect on the production, it is only for a short period and a tight peg routine to a low expansion country that adapts to issues of financial validity could increase endured corruption (Popkova, 2010). Corruption can have a significant impact on the composition of a country's capital inflows, making it more vulnerable to international creditors shifting their expectations (Wei and Wu 2002).

Corruption, in a nutshell, refers to the extent to which firms or sometimes local citizens bribe officials in their communications to achieve their specific goals. However, in general, researchers view corruption as an indicator of poor governance, which includes not only bureaucratic corruption, but also deviations from arbitrary government regulations and the rule of law. In fact, the two hypotheses are intertwined. The degree of corruption in a country may affect the composition of inflows in such a way that foreign creditors may change their perception and shift

their capital to another country, and this brings a negative impact on economic growth in the long run.

4.9 Hierarchical Moderation

Table 4. 11: Results for Hierarchical Moderation

Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Constant	11.9960	12.0111	12.7408	11.9960	13.5690
	(.000)	(.000)	(.000)	(.000)	(.000)
Credit to private Sector (CPS)	.0280	.0267	.0099	.0143	.0051
	(.000)	(.000)	(.201)	(.103)	(.562)
Investor Protection (INP)	-.5047	-.4569	-.4767	-.8851	-.2483
	(.000)	(.000)	(.000)	(.023)	(.539)
Foreign Exchange Rate (FER)	.0004	.0003	.0003	.0003	.0009
	(.001)	(.004)	(.003)	(.003)	(.000)
Corruption (CP)	-	-.2179	-.8887	-.8019	-.8845
		(.037)	(.000)	(.002)	(.000)
First moderation (CPS*CP)	-	-	.5807	.5062	.5976
			(.002)	(.012)	(.002)
Second moderation (INP*CP)	-	-	-	1.6823	-.6956
				(.283)	(.666)
Third moderation (FER*CP)	-	-	-	-	-.2607
					(.000)
R^2	.1086	.1189	.1407	.1433	.1894
R^2 change	.0000	.0103	.0218	.0026	.0461
Wald chi2	45.55	50.33	60.90	62.08	86.47
P > chi2	.000	.000	.000	.000	.000

Table 4. 12: Summary of Hypotheses and Methods of Estimation

	Statement	Method	Test statistic	Decision
$\boldsymbol{H_{01}}$**:**	Credit to private sector does not influences economic growth in COMESA Countries.	Multiple regression (Random effects)	$\beta = .0267$, $p = .000$	Null hypothesis rejected
$\boldsymbol{H_{02}}$:	Investor protection has no significant effect on economic growth among COMESA Countries.	Multiple regression (Random effects)	$\beta = -.4568$, $p = .000$	Null hypothesis rejected
$\boldsymbol{H_{03}}$:	Foreign exchange rates do not have any effect on economic growth in COMESA Countries	Multiple regression (Random effects)	$\beta = .0003$, $p = .004$	Null hypothesis rejected
$\boldsymbol{H_{04}}$:	Corruption index has no significant influence on economic growth in COMESA Countries.	Simple Regression (Hayes Model 1)	$\beta = -.2179$, $p = .037$	Null hypothesis rejected
$\boldsymbol{H_{05a}}$:	There is no moderating role of corruption on the relationship between credit to private sector and economic growth in COMESA countries.	Simple Regression (Hayes Model 1)	$\beta = .006$, $p = .690$	Null hypothesis failed to be rejected
$\boldsymbol{H_{05b}}$:	Corruption does not have a significant moderating role on the relationship between investor protection and economic growth in COMESA countries.	Simple Regression (Hayes Model 1)	$\beta = -.140$, $p = .004$	Null hypothesis rejected
$\boldsymbol{H_{05c}}$:	Corruption does not moderate the relationship between foreign exchange rate and economic growth in COMESA countries.	Simple Regression (Hayes Model 1)	$\beta = .0003$, $p = .000$	Null hypothesis rejected
$\boldsymbol{H_{06}}$:	There is no cointegrating relationship between credit-to-private sector, investor protection, foreign exchange rate, corruption perception and economic growth in COMESA countries.	Johansen Fisher Panel Cointegration Test	$p = 0.2045$	Presence of co-integration

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, POLICY RECOMMENDATION AND SUGGESTIONS FOR FURTHER RESEARCH

5.1 Introduction

This chapter provides a review of this study's main empirical findings. It recommends different policy recommendations based on these results that could be adopted by countries trading in COMESA. These policy recommendations could also be of benefit to policy makers responsible for updating and improve economic growth by enhancing credit to private sector, strength of investor protection, regulate foreign interest rates and reduced the rate of corruption in respective countries. Finally, the chapter underlines the potential opportunities in this field of study for future studies.

5.2 Summary of Findings

Economic growth measured using real GDP and over the study period had mean 85636.44 million USD. The least country had 706.37 million USD while the maximum value was 1300000 million USD. This is an indication that over the years, some of COMESA countries have been on improving trend and has made significant economic, structural, and political reforms that have driven and sustained its economic growth. Countries that have had a low GDP compared to other COMESA counterparts are Comoros, Djibouti, Eritrea, and Seychelles while countries such as Kenya and Egypt have had the potential growth in GDP

Countries such as Mauritius, Egypt, Kenya, and Seychelles have had high ration of CPS countries with investor protection values close to zero have weak investor protection. Standard deviation of investor protection was 1.203 with a mean of 4.84754 implies that values were close to the mean and that each COMESA country have an average investor protection. According to officially recognized international

sources compiled by the World Bank. The index ranges from 0 (little to no investor protection) to 10 (greater investor protection). Countries with a strong investor protection are Mauritius, Djibouti, and Rwanda whereas DRC, Sudan and Eswatini have weak investor protection in COMESA trading bloc. COMESA countries with weak currency against USD were Uganda, Madagascar, Burundi, DRC, and Rwanda. Some of the COMESA with different and strong currency against USD are Egypt, Eswatini, Ethiopia and Seychelles. The corruption perception has as a range from 0 to 10 with zero regarded as the highest level of corruption while 10 implies less corrupt. The mean corruption perception index was 2.7 with its deviation of 0.850 and it implies that majority of these countries trading in COMESA are corrupt. The prevalence of corruption across COMESA countries was observed in Sudan, Zimbabwe, DRC and Burundi, while Seychelles, Rwanda, Egypt and Kenya had low indexing compared to their counterparts.

The study estimated random effects and fixed effects. The estimates were presented and compared using Hausman test. Hausman compares the coefficients under certain properties. The first property is both estimates are consistent with the true parameters of the model under the null hypothesis of the right model specification. The second property is the model estimates should have different probabilities limit. This property gives the test its power. As per the suggestions of Hausman, random effect model was adopted in testing the hypotheses. Random effect models assist in controlling for unobserved heterogeneity when the heterogeneity is constant over time and not correlated with independent variables.

There was no unit root at levels panel regression analysis was computed on the series in their levels. Results of regression analysis indicated that the modelled variables fitted the data very well as explained by Wald test. This is a good indication since it

points to a strong correlation which indicates that the explanatory variables jointly have a significant impact on the economic growth of COMESA countries. Credit to private sector, strength of investor protection, foreign exchange rates and corruption explained at least 61.74% (R-square) of the variation of the economic growth of 18 countries in COMESA trading bloc. In this model, the direct effects, credit to private sector and foreign exchange rates positively and significantly influenced economic growth Strength of investor protection and corruption perception index negatively and significantly affected economic growth. On the other hand, corruption moderated positive the link between credit to private sector and foreign exchange rates on economic growth while it negatively moderated the relationship between investor protection and economic growth.

5.3 Conclusion

Based on the findings, the study concluded by expounding that an increase in credit to private sector spurs economic growth. This is because investors are willing to invest in more risky venture while encouraging safe borrowers to be more effective. A depreciation of the currency can make a country's exports cheaper and imports more expensive. The financial sector, especially in the formal sectors of the economy, is critical in channeling savings into productive investment. The banking sector is widely regarded as an important economic conduit for financial intermediation. Credit to private sector increases a country's productive capacity.

Protecting investors entails expressing risk that may arise and have a negative impact on their investment. According to the findings of the demand effect, better protection causes an increase in interest rates and a decrease in investor income, lowering deposit and investment and thus cutting supplies for the next period. The supply effect becomes stronger as capital flow restrictions tighten. According to the study, the

positive effect of investor protection on growth is stronger in countries with fewer restrictions. A growing economy can entice investors who anticipate higher revenues/profits in the future. Consumption demand rises as production increases. and savings coming into the financial system which will allow it to extend credit.

Goods from countries whose currencies are pegged to the dollar will become more competitive against those from other countries as their currencies depreciate in line with the dollar. This can boost exports while decreasing imports and improving trade balances with other countries. Countries with floating exchange rates, on the other hand, can expect their currencies to appreciate. Trading partners may feel the impact of lower import demand sooner. As a result, currency depreciation is frequently a source of concern for trading partners. Furthermore, due to differences in products traded, some countries' trade is more responsive to changes in price competitiveness, while others are more sensitive to trading partner economic growth. Consequently, a deprecation of a currency may have variable effects on trading partners.

Changes in the exchange rate, according to economic theory, can cause a shift in stock prices, both intrinsically and extrinsically, in the case of multinational corporations. Along with the importance of the country of legal origin and investor protection, corruption appears to be another major source of uncertainty in the stability of a financial system. Transparency International defines corruption as "the misappropriation of entrusted power for personal gain. Corruption at both the public and state levels is included in this interpretation. Transparent countries are less corrupt, which reduces former uncertainty and volatility in the equity market. The findings, on the other hand, confirm that corruption discourages private investment, implying that corruption increases the costs of doing business while increasing uncertainty about the future.

5.4 Policy Recommendations

The study made some policy recommendations as per the objectives. The study suggests these policies to the respective governments of COMESA countries.

i. Credit to private sector have shown a significant positive effect on economic growth, there need to facilitate and strengthen credit growth to respective small and medium-sized enterprises in each nation, which are the engine of the country's economy. To improve credit access, the cost of credit must be reduced, the interest rate cap removed, and the collateral registry must be expedited. The insufficiency of credit expansion had a negative impact on economic growth. In theory, the adoption of new innovations and policy developments in the financial sector is expected to create a favorable environment for borrowers, thereby increasing private sector credit demand.

ii. Investor protections play a significant role in a country's equity market volatility. It is hypothesized that proper investor protection is critical for a country to have a stable equity market because they reduce uncertainty and increase investor confidence. COMESA countries should encourage investment by lowering interest rates and saving by borrowing. Tax breaks are given by governments to industries in which they want to encourage investment. Governments can also exempt certain types of savings from taxation to encourage savings.in this way, they protect investors which are the essential contributors of economic growth

iii. Since the study found foreign exchange rate to have a positive effect on economic growth (though at a very small coefficient). In this regard, this can only work in devaluing the currency and can only work in the short run. According to the short-run relationship, depreciation boosts growth, but this is only a temporary fix with

long-term negative consequences. Depreciation/devaluation can only reduce economic growth in the long run; thus, depreciation/devaluation works well in the short run but has negative long-run consequences. Based on these findings, the depreciation policy of increasing exports and employment in the economy may not be the best policy. To avoid misalignments (overvaluation or undervaluation of the currency), the study recommends that COMESA countries should have exchange rate determination to the forces of demand and supply, allowing the foreign exchange rate to revert to its own equilibrium.

iv. Corruption may have both positive and negative impact on economic growth. For a long run relationship, corruption hampers economic growth. To curb these negative effects, governments in respective COMESA countries must make laws that reduces corruption such as limiting discretion which entails making laws and government procedures available to a wide range of society. This could be accomplished by publishing documents outlining legal requirements for obtaining permits for instance in common languages and in an easily accessible format. Finally, increasing accountability can be accomplished by enlisting the help of unbiased third parties to conduct government audits, as well as continuously monitoring and evaluating government procedures. This has been a success in places like Singapore and Hong Kong.

v. Corruption is widespread in most developing countries especially COMESA countries, but it does not have to remain so. Reduced corruption is a goal that can be achieved. COMESA countries must examine and streamline their government agencies. Citizens in these countries must have access to the information they require in order to make informed decisions. They must also hold their elected officials accountable once they have made their decision.

According to so suggestions by World Bank, corruption can be reduced by making Government bureaucracies more efficient. When government officials can take advantage of inefficient bureaucracies, corruption thrives. Poorly managed public sectors with complex regulations make it easy for these officials to skirt the rules. Reducing corruption entails, first and foremost, streamlining bureaucracy.

5.5 Suggestions for Further Research

i. The study suggest that future work should be done on Sub Sahara Africa since these countries have slow economic growth rate compared to other developed nations.

ii. There is need for a more robust analysis of regime changes since corruption perception is majorly a consequence of regimes. Different regime comes with its corruption especially when elected leaders are corrupt. This can be analyzed by using Markov-Chain Switching models. These models allow the control of different regimes.

iii. Since the study tested for a cointegrating relationship and confirmed presence of long run effect, it is suggested that further research should estimate panel vector error correction model to identify the strength and magnitude of short run and long run relationships.

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APPENDICES

Appendix I: COMESA Countries

<table>
<tr><th>Hone of Africa</th><th>African Great Lakes</th><th>Former members</th></tr>
<tr><td>  Djibouti
  Eritrea
  Ethiopia
Egypt</td><td>  Burundi
  Kenya
  Malawi
  Rwanda
  Uganda
Somalia</td><td rowspan="5">  Lesotho
  Mozambique
  Tanzania
  Namibia
  Angola</td></tr>
<tr><td>North Africa</td><td>Southern Africa</td></tr>
<tr><td>  Libya
  Sudan
  Tunisia
  Comoros
  Madagascar
  Mauritius
  Seychelles</td><td>  Eswatini (Swaziland)
  Zambia
  Zimbabwe</td></tr>
<tr><td></td><td>Central Africa</td></tr>
<tr><td></td><td>  Democratic Republic of the Congo</td></tr>
</table>

Source: COMESA website

Appendix II: Map of COMESA

Source: COMESA website

Appendix III: Raw Results

UNITROOT TESTS

LLC UNIT ROOT RESULTS

```
. xtunitroot llc rgdp

Levin-Lin-Chu unit-root test for rgdp
-------------------------------------
Ho: Panels contain unit roots               Number of panels  =     21
Ha: Panels are stationary                   Number of periods =     18

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -16.1952
 Adjusted t*         -9.6568        0.0000
------------------------------------------------------------------------------

. xtunitroot llc  cps

Levin-Lin-Chu unit-root test for cps
------------------------------------
Ho: Panels contain unit roots               Number of panels  =     21
Ha: Panels are stationary                   Number of periods =     18

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
```

```
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -14.8064
 Adjusted t*         -7.6030        0.0000
------------------------------------------------------------------------------

. xtunitroot llc   inp

Levin-Lin-Chu unit-root test for inp
------------------------------------
Ho: Panels contain unit roots               Number of panels  =     21
Ha: Panels are stationary                   Number of periods =     18

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -12.6015
 Adjusted t*         -5.9613        0.0000
------------------------------------------------------------------------------

. xtunitroot llc    fer

Levin-Lin-Chu unit-root test for fer
------------------------------------
Ho: Panels contain unit roots               Number of panels  =     21
Ha: Panels are stationary                   Number of periods =     18

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -20.2400
 Adjusted t*        -11.9448        0.0000
------------------------------------------------------------------------------
```

```
. xtunitroot llc     cpi

Levin-Lin-Chu unit-root test for cpi
-----------------------------------
Ho: Panels contain unit roots               Number of panels  =     21
Ha: Panels are stationary                   Number of periods =     18

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -14.4933
 Adjusted t*         -4.2658        0.0000
------------------------------------------------------------------------------
```

IPS UNIT ROOT RESULTS

```
. xtunitroot ips rgdp

Im-Pesaran-Shin unit-root test for rgdp
--------------------------------------
Ho: All panels contain unit roots           Number of panels  =     21
Ha: Some panels are stationary              Number of periods =     18

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                     Statistic      p-value         1%      5%      10%
------------------------------------------------------------------------------
 t-bar                -4.1302                    -1.950  -1.820  -1.750
 t-tilde-bar          -2.9126
 Z-t-tilde-bar        -9.2327        0.0000
------------------------------------------------------------------------------
```

```
. xtunitroot ips  cps

Im-Pesaran-Shin unit-root test for cps
--------------------------------------
Ho: All panels contain unit roots           Number of panels  =     21
Ha: Some panels are stationary              Number of periods =     18

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                            Fixed-N exact critical values
                    Statistic      p-value         1%      5%      10%
------------------------------------------------------------------------------
 t-bar               -4.6976                    -1.950  -1.820  -1.750
 t-tilde-bar         -3.0790
 Z-t-tilde-bar      -10.2334        0.0000
------------------------------------------------------------------------------

. xtunitroot ips   inp

Im-Pesaran-Shin unit-root test for inp
--------------------------------------
Ho: All panels contain unit roots           Number of panels  =     21
Ha: Some panels are stationary              Number of periods =     18

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                            Fixed-N exact critical values
                    Statistic      p-value         1%      5%      10%
------------------------------------------------------------------------------
 t-bar               -3.7752                    -1.950  -1.820  -1.750
 t-tilde-bar         -2.7814
 Z-t-tilde-bar       -8.4444        0.0000
------------------------------------------------------------------------------
--
```

```
. xtunitroot ips   fer

Im-Pesaran-Shin unit-root test for fer
--------------------------------------
Ho: All panels contain unit roots          Number of panels  =     21
Ha: Some panels are stationary             Number of periods =     18

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                            Fixed-N exact critical values
                   Statistic      p-value         1%      5%      10%
------------------------------------------------------------------------------
 t-bar               -4.8335                    -1.950  -1.820  -1.750
 t-tilde-bar         -3.1208
 Z-t-tilde-bar      -10.4846        0.0000
------------------------------------------------------------------------------

. xtunitroot ips    cpi

Im-Pesaran-Shin unit-root test for CPI
--------------------------------------
Ho: All panels contain unit roots          Number of panels  =     21
Ha: Some panels are stationary             Number of periods =     18

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                            Fixed-N exact critical values
                   Statistic      p-value         1%      5%      10%
------------------------------------------------------------------------------
 t-bar               -4.2360                    -1.950  -1.820  -1.750
 t-tilde-bar         -2.9446
 Z-t-tilde-bar       -9.4254        0.0000
------------------------------------------------------------------------------
```

PANEL REGRESSION RESULTS

```
. xtreg  lngdp cps inp CPI fer,re

Random-effects GLS regression                   Number of obs      =       378
Group variable: year                            Number of groups   =        21

R-sq:  within  = 0.1129                         Obs per group: min =        18
       between = 0.6174                                        avg =      18.0
       overall = 0.1189                                        max =        18

                                                Wald chi2(4)       =     50.33
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lngdp |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cps |    .026655    .005584     4.77   0.000     .0157105    .0375995
         inp |  -.4568745   .0852703    -5.36   0.000    -.6240012   -.2897479
         CPI |  -.2178546   .1042011    -2.09   0.037    -.4220851   -.0136242
         fer |    .000319    .000111     2.87   0.004     .0001013    .0005366
       _cons |   12.01106   .4126249    29.11   0.000     11.20233    12.81979
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  1.6697469
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtreg  lngdp cps inp CPI fer, fe

Fixed-effects (within) regression               Number of obs      =       378
Group variable: year                            Number of groups   =        21

R-sq:  within  = 0.1133                         Obs per group: min =        18
       between = 0.5821                                        avg =      18.0
       overall = 0.1184                                        max =        18

                                                F(4,353)           =     11.27
corr(u_i, Xb)  = 0.0724                         Prob > F           =    0.0000

------------------------------------------------------------------------------
       lngdp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cps |   .0253202   .0057384     4.41   0.000     .0140344    .0366061
         inp |  -.4572909   .0871007    -5.25   0.000    -.6285925   -.2859893
         cpi |  -.2092065   .1066349    -1.96   0.051     -.418926    .0005131
         fer |   .0002717   .0001156     2.35   0.019     .0000443    .0004991
       _cons |   12.03979    .420666    28.62   0.000     11.21246    12.86711
-------------+----------------------------------------------------------------
     sigma_u |  .24034756
```

```
     sigma_e |  1.6697469
         rho |  .02029887   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(20, 353) =     0.36            Prob > F = 0.9954

. qui xtreg  lngdp cps inp CPI fer,re

. estimates store re

. qui xtreg  lngdp cps inp CPI fer,fe

. estimates store fe

. hausman fe re

                 ---- Coefficients ----
             |       (b)            (B)              (b-B)      sqrt(diag(V_b-
V_B))
             |       fe             re         Difference          S.E.
-------------+----------------------------------------------------------------
         cps |    .0253202       .026655       -.0013348         .0013222
         inp |   -.4572909    -.4568745       -.0004164         .0177628
         cpi |   -.2092065    -.2178546        .0086482         .0226522
         fer |    .0002717       .000319       -.0000473         .0000323
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        2.78
                Prob>chi2 =      0.5950
```

CONTROL REGIME CHANGE

```
by regime, sort: xtreg   lngdp cps inp fer cpi
-> regime = 1

Random-effects GLS regression                   Number of obs      =       146
Group variable: year                            Number of groups   =        21

R-sq:  within  = 0.6374                         Obs per group: min =         6
       between = 0.5508                                        avg =       7.0
       overall = 0.5508                                        max =         7

                                                Wald chi2(4)       =    172.88
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lngdp |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cps |   -.116921   .0155925    -7.50   0.000    -.1474817   -.0863604
         inp |  -.2937286   .0885053    -3.32   0.001    -.4671958   -.1202614
         fer |   .0004987   .0001059     4.71   0.000     .0002911    .0007063
         cpi |  -.0199187   .0966411    -0.21   0.837    -.2093318    .1694944
       _cons |   12.27508   .3924589    31.28   0.000     11.50588    13.04429
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .98766579
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
-> regime = 2

Random-effects GLS regression                   Number of obs      =        63
Group variable: year                            Number of groups   =        21

R-sq:  within  = 0.8645                         Obs per group: min =         3
       between = 0.0233                                        avg =       3.0
       overall = 0.8029                                        max =         3

                                                Wald chi2(4)       =    236.32
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lngdp |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cps |   .0299317   .0111246     2.69   0.007      .008128    .0517355
         inp |   .1620033   .3633925     0.45   0.656    -.5502329    .8742395
         fer |  -.0091044   .0009162    -9.94   0.000    -.0109001   -.0073087
         cpi |   1.285524   .2172013     5.92   0.000     .8598172    1.711231
       _cons |   7.120719   1.759872     4.05   0.000     3.671434       10.57
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  1.1550688
```

```
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
-> regime = 3

Random-effects GLS regression                   Number of obs      =        84
Group variable: year                            Number of groups   =        21

R-sq:  within  = 0.6321                         Obs per group: min =         4
       between = 0.4857                                        avg =       4.0
       overall = 0.6177                                        max =         4

                                                Wald chi2(4)       =    127.65
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lngdp |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cps |   .0618329   .0259345     2.38   0.017     .0110022    .1126637
         inp |  -1.411169   .1549626    -9.11   0.000     -1.71489   -1.107448
         fer |   .0006355   .0003887     1.63   0.102    -.0001264    .0013974
         cpi |   3.074348    .486645     6.32   0.000     2.120541    4.028155
       _cons |   7.271869   1.186373     6.13   0.000      4.94662    9.597118
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  1.1955735
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
-> regime = 4

Random-effects GLS regression                   Number of obs      =        85
Group variable: year                            Number of groups   =        21

R-sq:  within  = 0.0446                         Obs per group: min =         4
       between = 0.8568                                        avg =       4.0
       overall = 0.2287                                        max =         5

                                                Wald chi2(4)       =     23.72
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0001

------------------------------------------------------------------------------
       lngdp |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cps |   .0069913   .0034052     2.05   0.040     .0003173    .0136654
         inp |  -.2445195   .1050394    -2.33   0.020    -.4503928   -.0386461
         fer |    .000181   .0000495     3.65   0.000     .0000839    .0002781
         cpi |  -.0255506   .1237224    -0.21   0.836    -.2680419    .2169408
       _cons |   11.28688   .5064812    22.28   0.000     10.29419    12.27956
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .41875246
         rho |          0   (fraction of variance due to u_i)
```

PANEL COINTEGRATION

Johansen Fisher Panel Cointegration Test

Series: LNGDP CPS INP CPI FER

Date: 10/25/21 Time: 12:31

Sample: 1 378

Included observations: 378

Trend assumption: Linear deterministic trend

Lags interval (in first differences): 1 1

Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-eigen test)	Prob.
None	1019.	0.0000	713.1	0.0000
At most 1	437.4	0.0000	407.9	0.0000
At most 2	114.9	0.0000	88.83	0.0000
At most 3	59.68	0.0375	49.29	0.2045
At most 4	67.29	0.0079	67.29	0.0079

* Probabilities are computed using asymptotic Chi-square distribution.

Individual cross section results

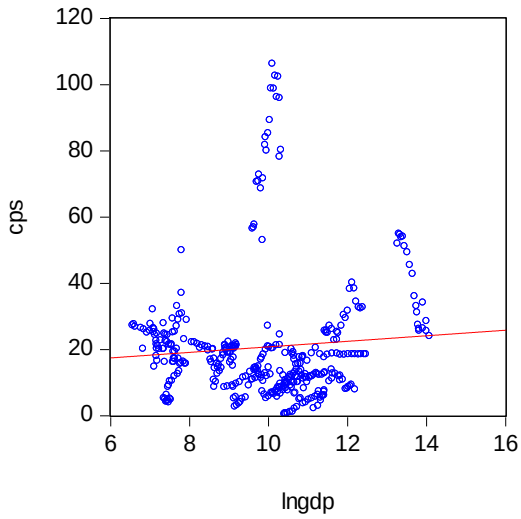
Cross Section	Trace Test Statistics	Prob.**	Max-Eign Test Statistics	Prob.**
Hypothesis of no cointegration				
2000	177.6817	0.0000	140.8740	0.0000
2001	136.8209	0.0000	76.2521	0.0000
2002	174.0615	0.0000	69.5900	0.0000
2003	179.6427	0.0000	97.2345	0.0000
2004	172.8634	0.0000	82.7319	0.0000
2005	211.0405	0.0000	124.1377	0.0000
2006	175.2575	0.0000	91.3005	0.0000

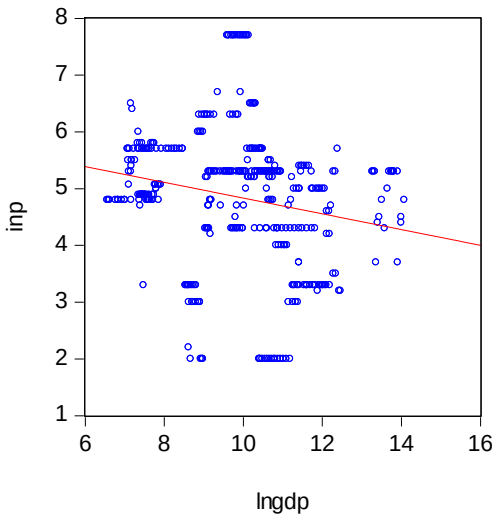
2007	164.2708	0.0000	86.5644	0.0000
2008	209.9179	0.0000	134.7249	0.0000
2009	138.8351	0.0000	70.1786	0.0000
2010	183.4466	0.0000	120.8989	0.0000
2011	164.6252	0.0000	99.0424	0.0000
2012	181.3325	0.0000	113.3308	0.0000
2013	227.3143	0.0000	158.5769	0.0001
2014	212.6672	0.0000	146.1703	0.0000
2015	267.2278	0.0000	185.5920	0.0001
2016	138.5778	0.0000	76.0153	0.0000
2017	184.3279	0.0000	101.8340	0.0000
2018	195.0900	0.0000	116.7087	0.0000
2019	161.1784	0.0000	70.7337	0.0000
2020	147.0836	0.0000	81.3082	0.0000
Hypothesis of at most 1 cointegration relationship				
2000	36.8077	0.3567	21.2157	0.2634
2001	60.5688	0.0021	38.5316	0.0013
2002	104.4715	0.0000	60.8480	0.0000
2003	82.4082	0.0000	36.2079	0.0031
2004	90.1315	0.0000	63.5584	0.0000
2005	86.9028	0.0000	62.5299	0.0000
2006	83.9569	0.0000	59.1374	0.0000
2007	77.7063	0.0000	56.4382	0.0000
2008	75.1930	0.0000	50.9508	0.0000
2009	68.6564	0.0002	47.8166	0.0000
2010	62.5477	0.0012	40.1132	0.0008
2011	65.5828	0.0005	35.5272	0.0039
2012	68.0017	0.0002	33.3612	0.0081
2013	68.7374	0.0002	40.2931	0.0007
2014	66.4969	0.0004	43.7700	0.0002
2015	81.6358	0.0000	50.8568	0.0000
2016	62.5626	0.0012	47.1606	0.0001
2017	82.4940	0.0000	64.4778	0.0000
2018	78.3813	0.0000	46.9515	0.0001
2019	90.4446	0.0000	45.9494	0.0001
2020	65.7754	0.0005	34.4697	0.0056
Hypothesis of at most 2 cointegration relationship				
2000	15.5920	0.7406	12.0878	0.5390
2001	22.0372	0.2965	11.7258	0.5749
2002	43.6236	0.0007	29.4912	0.0027
2003	46.2003	0.0003	32.1779	0.0010
2004	26.5731	0.1125	16.7079	0.1862
2005	24.3730	0.1851	11.6363	0.5838
2006	24.8196	0.1680	13.4686	0.4101
2007	21.2682	0.3411	13.1260	0.4407

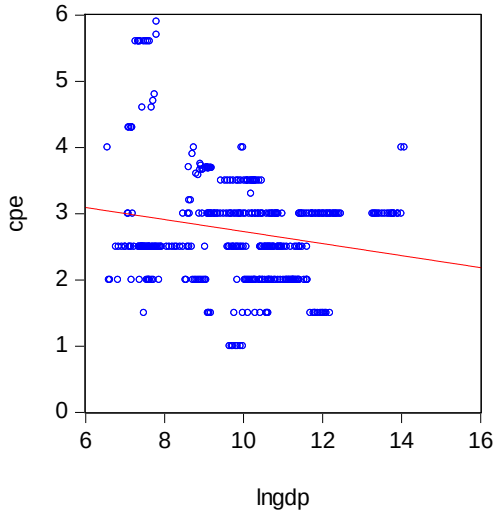
2008	24.2422	0.1904	12.6345	0.4864
2009	20.8398	0.3677	12.9215	0.4594
2010	22.4345	0.2750	16.4091	0.2019
2011	30.0556	0.0467	20.9293	0.0533
2012	34.6405	0.0128	22.2863	0.0343
2013	28.4443	0.0710	15.0967	0.2822
2014	22.7268	0.2597	14.4540	0.3289
2015	30.7790	0.0384	20.2649	0.0657
2016	15.4019	0.7535	12.2146	0.5266
2017	18.0162	0.5649	10.4801	0.6987
2018	31.4298	0.0321	20.3932	0.0632
2019	44.4952	0.0005	25.8845	0.0099
2020	31.3057	0.0333	22.8244	0.0286
Hypothesis of at most 3 cointegration relationship				
2000	3.5042	0.9394	2.3703	0.9796
2001	10.3114	0.2575	7.3328	0.4505
2002	14.1323	0.0794	12.1682	0.1045
2003	14.0224	0.0823	9.4790	0.2485
2004	9.8652	0.2912	7.8145	0.3979
2005	12.7367	0.1248	9.5744	0.2414
2006	11.3510	0.1908	8.4741	0.3325
2007	8.1422	0.4503	5.9660	0.6176
2008	11.6077	0.1767	7.8666	0.3924
2009	7.9184	0.4742	5.2924	0.7046
2010	6.0255	0.6925	4.0405	0.8551
2011	9.1263	0.3538	7.3456	0.4491
2012	12.3542	0.1407	10.3065	0.1926
2013	13.3476	0.1027	10.7930	0.1649
2014	8.2729	0.4367	8.0732	0.3713
2015	10.5142	0.2432	9.1701	0.2723
2016	3.1873	0.9578	3.1833	0.9338
2017	7.5361	0.5163	7.4363	0.4389
2018	11.0367	0.2093	11.0366	0.1524
2019	18.6108	0.0164	17.9723	0.0124
2020	8.4813	0.4155	8.4813	0.3319
Hypothesis of at most 4 cointegration relationship				
2000	1.1339	0.2869	1.1339	0.2869
2001	2.9785	0.0844	2.9785	0.0844
2002	1.9642	0.1611	1.9642	0.1611
2003	4.5433	0.0330	4.5433	0.0330
2004	2.0507	0.1521	2.0507	0.1521
2005	3.1623	0.0754	3.1623	0.0754
2006	2.8769	0.0899	2.8769	0.0899
2007	2.1762	0.1402	2.1762	0.1402
2008	3.7411	0.0531	3.7411	0.0531

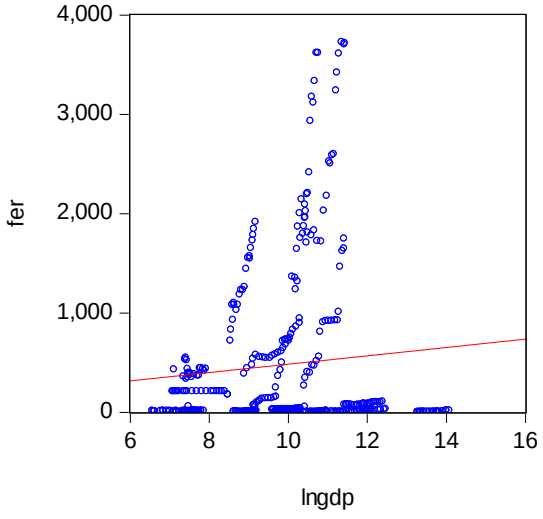
2009	2.6260	0.1051	2.6260	0.1051
2010	1.9850	0.1589	1.9850	0.1589
2011	1.7807	0.1821	1.7807	0.1821
2012	2.0477	0.1524	2.0477	0.1524
2013	2.5546	0.1100	2.5546	0.1100
2014	0.1996	0.6550	0.1996	0.6550
2015	1.3441	0.2463	1.3441	0.2463
2016	0.0040	0.9480	0.0040	0.9480
2017	0.0998	0.7521	0.0998	0.7521
2018	0.0001	0.9963	0.0001	0.9963
2019	0.6385	0.4243	0.6385	0.4243
2020	0.0000	0.9971	0.0000	0.9971

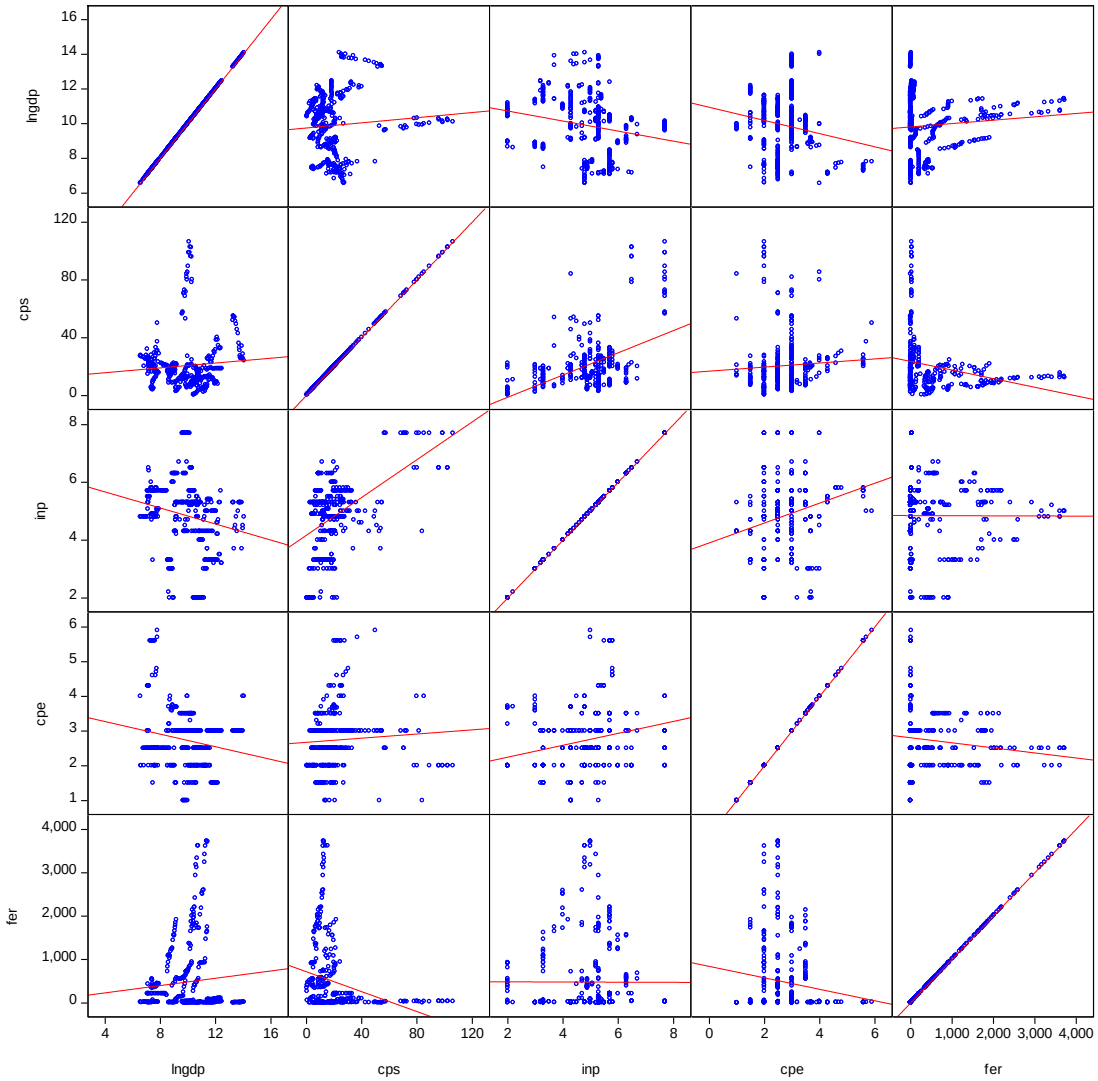
**MacKinnon-Haug-Michelis (1999) p-values







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