

UNIVERSITY OF CAPE COAST

INSTITUTIONS, FOREIGN DIRECT INVESTMENT AND DOMESTIC
INVESTMENT IN SUB-SAHARAN AFRICA

BY

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Degree in Economics

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Signature..... Date.....

Candidate's Name: Jacob Kwadzo Bravo Galah

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

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ABSTRACT

The study examines the effects of institutions and foreign direct investment on domestic investment in Sub-Saharan Africa (SSA) from 2006-2017. To achieve the objectives of the study, fixed and random effects estimation techniques were employed on annual panel data of 28 countries in Sub-Saharan Africa. Institutional variables (institutions) were found to have positive effects on domestic investment in SSA. Good institutions, therefore, contribute to increasing domestic investment in SSA. Again, the results indicate that an enhancement of government effectiveness in the presence of foreign direct investment, domestic private investment increases. The results also disclosed that institutions in general have positive effects on domestic private investment. The study, therefore, recommends that governments of SSA through their respective public and civil services should ensure the improvement of institutions in their respective countries to serve as a conduit for enhancing domestic investment in the subregion.

KEYS WORDS

Domestic Investment

Fixed and Random Effects Models

Foreign Direct Investment

Institutions

Sub-Saharan Africa

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DEDICATION

To Comfort Mansah, Akoto and Gladys Happy, Ladzedo.

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LIST OF ACRONYMS

ADI	Africa Development Indicators
CC	Control of Corruption
CPI	Consumer Price Index
DCPS	Domestic Credit to the Private Sector
DEBTSERV	Debt Service
DomI	Domestic Investment
DPriI	Domestic private investment
DPuI	Domestic Public Investment
DSF	Domestic Capital Self-financing
DV	Dependent Variables
ECOWAS	Economic Community of West Africa States
EXTDEBT	Total External Debt
FD	First Differenced
FDF	Foreign Debt Financing
FDI	Foreign Direct Investment
FE	Fixed Effect Estimation Techniques
G	Growth of real Output
GDP	Gross Domestic product
GE	Government Effectiveness
GFCF	Gross Fixed Capital Formation
GFCFPs	Gross Fixed Capital Formation, Private Sector
GFCFpub	Gross Fixed Capital Formation, Public Sector

GI	Governance indicators
GNI	Gross National income
IMF	International Monetary Fund
INDV	Independent Variables
INFLA	Inflation
INS	Institutional Variables
INST	Aggregated Institutional Variables
LDCs	Less Developing Countries
LSDV	Least Square Dummy Variable
M&A	Mergers and Acquisitions
OECD	Organisation for Economic Cooperation and Development
PPP	Public-Private Partnership
PS	Political Stability and Absence of Terrorism
PUB	Public Investment
PV	Private Investment
RE	Random Effect Estimation Techniques
RL	Rule of Law
RQ	Regulatory Quality
SDEBT	Private External Debt Stock
SSA	Sub-Saharan Africa
SSE	Sum of Square Errors
VA	Voice and Accountability
WDI	World Development Indicators

WGI

World Governance Indicators

CHAPTER ONE

INTRODUCTION

Background to the Study

Investment has been acclaimed in the economic discourse as a key component of growth. This is because, it has been deemed important for countries to enhance economic growth, upsurge employment and decrease poverty and inequality. Investment can enhance production volume/capacity via the acquisition of new equipment which will incorporate technical progress and hence upsurge labour productivity. Ouedraogo and Kouaman (2014) employed a dynamic Generalized Method of Moments techniques for 32 Sub-Saharan Africa countries from 2006 to 2011 on governance and private investment in Sub-Saharan African and pointed out that excessive regulations influence private investment negatively whereas an improved business environment serves as a catalyst to trigger investment grow.

Development is the aim and goal of every nation and its policy makers. One of the necessary factors needed for growth to translate into development is investment. According to Molapo and Damane (2015), Domar (1946) and Harrod (1939), investment is a core macroeconomic variable needed for economic growth and development of countries. This unquestionably means that there is a strong connection between investment and the degree of economic growth. Based on this purpose, various developed and developing nations have for many years depended largely on investment to resolve problems, especially those connected to growth and development.

Durham (2004) indicated a positive link between investment and economic growth. Practically, nations which have accumulated high level of investment normally attained quicker rates of economic growth and development than those that did not grow their investment spirit. According to Hamuda et al. (2013), nations which have amassed high level of long-term investment belong to the cadre of developed countries. One of such countries that accumulated investment and became the fastest growing economy is China. Grounded on this bedrock, that investment culture needs to be accorded the necessary attention by the investors or entrepreneurs in their respective countries via their everyday activities, and including government policies, planning and implementation.

Domestic investment has a significant place in economies of every country, in the sense that it is supreme in attaining economic development (Bakari, 2017). Domestic investment has been considered important to the Sub-Saharan Africa region because, it ensures creation of jobs and feeding of the teeming population.

Domestic investment consists of both private and public investments, nevertheless in contemporary times, emerging countries have laid greater importance upon the development of the private sector in the sense that it continued to be an important engine of growth in all contemporary economies across the world. This sector improves competitiveness of countries' products and services in national, regional and international markets. Consequently, the government of Sub-Saharan Africa countries are taking steps to make the private sector the game changer to enable them switch their economies to upper middle-income status.

The private sector plays a vital role in stimulating economic growth and development which is perceived to have received more important attention than ever before. This is due to the awareness that investment is the central driver of long-run economic growth and increased productivity in Less Developing Countries (LDCs). The function of investment in economic growth and development is confirmed by current empirical studies founded on data on African countries. Mijiyawa (2013) in his studies found that investment, government effectiveness, credit to the private sector, exports and the share of agricultural value added in gross domestic product are important determining factors of investment growth in Africa. Ghazanhcyan and Stotsky (2013) found some indication that investment boost growth in Africa. This cross-country indication has also been buttressed by some country level study signifying direct association between investment and economic growth in African countries.

An analysis of long-term trends of investment in most emerging countries has shown that public investment has experienced a substantial decline since the beginning of the 1980's. The period of this decrease is historically important. This occurred at the time where most developing countries were in external debt problems or crises. Governments at the time, ran out of funds in course of trying to meet their external debt responsibilities, public investment might have become the target of severe cuts in budgets that followed. Secondly, the debt crises were largely linked with the disappointing performance of public enterprises despite huge financial resources devoted to them. This gave a groundswell (rise) of liberalization, denationalization and other policies directed towards the private

sector development at the expense of public investment in some instances (Badawi, 2005).

Although most governments embarked upon fiscal consolidation and privatization programmes post 1980s, it had never been clear in the empirical literature of the complementarity and substitutability of domestic investment. However, some founding papers had provided little empirical evidence to clarify on the subject, whether public policy either crowded-out or in domestic private investment. Authors as Greene and Villanueva (1991), Blejer and Khan (1984), Aschauer (1989) have shown an indication of the complementarity amid fiscal policy (public spending) and domestic private investment. Public spending usually boosts private investment by cumulative returns on private investment via provision of essential infrastructure (that are road networks, communication, energy etc.).

Rossiter (2002) and Chhibber and Wijnbergen (1988) pointed out the negative impact of domestic public investment on domestic private investment. They indicated that domestic public investment could crowd-out domestic private investment when supplementary investment is funded by a deficit, that may cause a rise in the interest charges, credit rationing as well as tax burden. Motlaleng et al (2011) confirms these propositions by estimating two investment functions for Namibia using quarterly data from 1990 to 2005. These authors disclosed that whereas increases in government spending crowd in domestic private investment, however, government deficits crowd it out, confirming both the Keynesian and Neoclassical views. In addition, Tugcu and Coban (2015) employed a dynamic heterogeneous ARDL model with a panel data of 28 countries from 2000 to 2012

to investigate whether budget deficit crowds-out or in private investment. Their results illustrate that budget deficit positively affects private investment. This result supports the Keynesian view that suggests an expansionary fiscal policy enhances private investment by increasing the level of economic activity.

The existing studies on the subject either do not include institutional indicators, or do not take into account the institutions which might also influence domestic investments in developing countries as Sub-Sahara African countries. These institutional factors are not considered because, most senior economists' interests over the years were based on economic factors (monetary and fiscal policies) to find how they influence domestic investment. However, some authors found out in their studies that political instability and poor institutions (weak property rights, high corruption and excessive regulation) dishearten domestic private investment as well as FDI (Mauro, 1995; Campos et al., 1999).

As indicated in literature, institutions are vital determining factors of domestic investment in the emerging economies (Blonigen, 2005; Dawson, 1998). In similar study, political instability was found to be negative and has statistically important influence on domestic private investment in developing nations (Rogoff and Reinhart, 2003 and Gyimah-Brempong et al., 1999). On the other hand, corruption (connected with poor institution) raises costs of production and dampens domestic private investment (Mauro, 1995; Campos et al., 1999; Wei and Wu, 2001). According to Li and Resnick (2003), property rights protection decreases dangers (risks) and increases investment. This implies that fiscal and

monetary variables may not be the only factors which will affect domestic investment in SSA nations.

Some of the institutional factors include political stability and absence of terrorism, voice and accountability, rule of law, control of corruption, regulatory quality, government effectiveness and many others. These factors according to Lim (2013) may have the potential of influencing domestic investment. Therefore, it is important they are taken into account when analysing the possible factors that influence domestic investment decisions.

The domestic investment levels of Sub-Sahara African countries over the years, have not been sufficient enough to expand the capital stock and productive capacities of their economies to generate the desired economic growth, as compared to other developed countries like the USA, Japan, UK, Canada etc. It is therefore, very worrying because slightly strong growth rates could be achieved and sustained over long periods only when the economies of the SSA are able to keep and maintain a sizeable proportion of their Gross Domestic Product (GDP) as domestic investment.

Foreign direct investment (FDI) may influence domestic investments in many ways. Thus, it can produce complementary effects of crowding in and or the substitution effects of crowding out on domestic investment. These may arise as a result of the type of FDI, strength of local companies and orientation of economic policy. Ashraf and Herzer (2014) pointed out that Mergers and Acquisition (M&A) do not have negative influence on domestic investment, although greenfield or completely new inflows of foreign direct investment seems to have a displacing

impact on domestic investment. Furthermore, an influx of foreign firms in domestic economy, might take away the possible investment opportunities which formerly were available to domestic investors. Again, foreign multinational companies which invest directly in countries other than theirs, turn to displace (crowd out) domestic private investment, in sense that they have improved financial stands than the local firms. The crowding-out effects become intensive when the foreign companies compete directly with the local companies in similar or same businesses.

Statement of the Problem

Domestic investment is a vital precondition for economic growth and hence development, since it permits businesspersons or investors to put economic activity in gear by putting factors of production together to produce goods and services. It has been generally accepted among economists that, it exercises a major effort to promote innovation, enhance employment, decrease poverty and increase national welfare (Ameer and Sohag, 2020; Bakari, 2017).

Besides, much of the existing literature agrees with growth theories on the vitalness of capital formation resulting from domestic investment that leads to long run growth (Mijiyawa, 2013; Fedderke et al., 2006). Adams Samuel (2009) indicated in his study that domestic investment has positive effect on economic growth in SSA economies. According to Lim (2013), most of the existing works done on capital formation placed emphasis on economic factors which are mostly cyclical in nature. For instance, real exchange rate policy, fiscal and monetary policy, and capital inflows are enhanced to achieve the needed capital formation for growth. Studies on the effect of institutions on domestic investment is

uncommon as most studies focus more on foreign direct investment (Mengistu and Adhikary, 2011; Samini and Ariani, 2010; Asiedu, 2003, Globerman and Shapiro, 2002 and Morisset, 2000).

According to North (1990) development depends largely on the institutional factors that prevail in a particular economy. This means that for development to take place, the institutional environment must be developmentally oriented. He further defined institutions as “the formal and informal rules of the game and their enforcement characteristics” (North 2005a). This means that institutions are humanly designed rules and regulations to guide human behaviour in society. Companies invest when the investment atmosphere is conducive and institutional quality is sub set of the investment atmosphere in Sub-Saharan African countries.

Among the limited works on the role institutions play within domestic investment decision and economic performance is that of Iheonu, Ihedimma and Onwuanaku (2017) which examines the effect of institutional superiority on economic performance in West Africa. Their work used control of corruption, government effectiveness, regulatory quality and rule of law as institutional quality factors with panel data of 12 West African states from 1996 to 2015. They used random and fixed effect models, and panel two-stage least square estimation techniques. The outcome revealed that all factors of institutional quality used in their study produced positive and substantial effect on economic performance in West Africa. They conclude that economic activities in West Africa could be improved when institutions are enhanced.

In empirical examining the effect of institutions and FDI on domestic investment in Sub-Saharan Africa, this study uses balanced panel data of 28 Sub-Saharan Africa nations as described in World Development Indicators (WDI, 2017) and World Governance Indicators (WGI, 2017) World Bank for the period 2006 to 2017. The choice of countries was based on data availability constraint.

Purpose of The Study

The main purpose of this study is to survey the effects of institutions and FDI on domestic investment in Sub-Saharan African countries from the period 2006 - 2017. The specific objectives of the study are as follows:

- i. To examine effects of institutions on domestic private investment.
- ii. To survey effects of institutions on domestic public investment.
- iii. To investigate joint effects of institutions and FDI on domestic private investment

Research Hypotheses

The study attempts to test the following hypotheses;

- i. **H₀**: Institutions do not affect domestic private investment.
H₁: Institutions affect domestic private investment.
- ii. **H₀**: Institutions do not affect domestic public investment.
H₁: Institutions affect domestic public investment.
- iii. **H₀**: There is no joint effect of institutions and FDI on domestic private investment.

H₁: There is joint effect of institutions and FDI on domestic private investment.

Significance of the Study

The findings of the study would be significant to a varied number of people. These include policy makers, magnates (entrepreneurs), investment analysts and academicians. The study would provide scientific results on the subject of institutions, FDI and their effects on domestic investment. Particularly, it would be of significance to policy makers in their pursuit for providing suitable incentives to encourage domestic investment in the midst of FDI in SSA countries. This will avoid a situation where scarce resources would be directed towards wrong policies as far as the promotion of domestic investment is concerned. The findings will provide the investors and investment analysts an insight into the actions of governments and give appropriate interpretations to policy directions in the various SSA economies. Finally, researchers and academicians would find this study useful due to limited research on the subject matter in African setting. This study would therefore add to present knowledge in the subject area.

Limitations

The key problem of this study was the inaccessibility of data for most of SSA countries. The study concentrated on 28 Sub Saharan African countries for the analysis of the effects of institutions and FDI on domestic investment, which spans from period 2006-2017. Besides, most of the SSA countries were dropped owing to missing data points or values and also no data on some of the variables for some

of the countries. Additionally, data on the institutions and other variables were gathered from different data sources. Domestic public investment was obtained by subtracting domestic private investment captured as (Gross fixed capital formation, private sector percentage of GDP) from total investment also captured as (Gross fixed capital formation percentage of GDP). This therefore, might risk underreporting or overreporting of the values.

Organisation of the Study

This study is organized into five chapters. Chapter one is the introduction and it covers background to the study, statement of the problem, purpose of the study, research hypotheses, significance of the study, limitations and organization of the study. Chapter two presents review of relevant theoretical and empirical literature. It also presents how institutions affect domestic investment. Chapter three discusses the research methods and the estimation techniques employed in the study; the sample size, description and sources of data. Chapter four encompasses the presentation and analysis of empirical results obtained from the regressions. Chapter five which is the final chapter displays the summary, conclusions, and policy recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter considers both theoretical foundations and empirical literature review of the relationship between Institutions and FDI on Domestic Investment. The first section presents some conventional theories which have dominated the literature in the examination of the determining factors of domestic investment in the advanced countries as well as the variants (modified) of such models recommended for Less Developed Countries (LDCs). The second section presents institutional concept. This section is sub-divided as follows: institutions and classification systems; institutions, FDI and sources of domestic investment finance; institutions and domestic investment; FDI and domestic investment and interaction between institutions, FDI and domestic investment. The last section provides empirical review to external debt overhang and capital formation.

Theoretical Literature

In economics, an investment means procurement of productive goods which are not meant for consumption today but are used to generate capital for future use. These are productive or capital goods used in the production of related commodities to improve the welfare of a population. According to Weirich (1983), investment is principally based on profit motive and is full of risk and uncertainty. Risk is a quantifiable or measurable probability of losing money or not obtaining the desired interest on one's investment. Nevertheless, investment is a dicey venture, investors invest with the expectation of receiving a capital benefit at the time of sale. Some

financial experts indicate that individuals invest with the notion that, they want a profit on the investment made in order to reward for their time, the anticipated rate of inflation and uncertainty of the return; (Pollack and Heighberger, 2002; Mensahklo, Kornu and Dom, 2017).

The empirical investigations of investment performance follow number of hypothetical representations recommended in many schools of thought. Besides, these theories of private investment can generally be classified as simple accelerator theory linked to Clark (1917), flexible accelerator model also connected with Keynes (1936), neoclassical model linked to Hall and Jorgenson (1971) and Tobin's Q model as well linked to Tobin (1969).

The simple accelerator model of Clark indicates that a companies' desired or anticipated capital-output ratio usually is unevenly continuous. This model commences with the idea that a certain quantity of capital stock (K) is vital to support a specified level of economic activity. This association is defined as equivalent to output (Y), thus, $K_t = kY_t$ such that net investment is proportionate to variation (change) in the desired output:

$$K_t - K_{t-1} = I_t = k\Delta Y_t \quad (1)$$

Where k = desired capital-output ratio, Y_t = is output, I_t = is net investment, K_t = is the capital stock in period t , K_{t-1} = is the stock of capital at the end of period $t - 1$.

Furthermore, simple accelerator model is questioned on the ground that companies react to changes in demand in that investment at all times is adequate to ensure that the anticipated capital stock is equivalent to the actual or exact capital stock which is not the case. Besides, the model accepts that the ratio of anticipated

capital to output is continuous (constant), until now, it changes with a disparity in the cost of capital and technology. Again, the model did not take into consideration the investors' expectations, profitability, as well as the cost of capital as factors which will affect investment.

Therefore, owing to the limitations of the simple accelerator of Clark, Keynesians have conventionally or unoriginally come up with universal method of accelerator model known as the flexible accelerator model propounded by Hall and Jorgenson (1971) which is also called partial adjustment representation of investment grounded on the best or ideal accumulation of capital suggested by Goodwin (1951) and Treadway (1974). This model states that capital changes towards its anticipated level by a constant percentage of the variance between anticipated and exact or actual capital. The fundamental idea behind this theory is that when the lacuna or hiatus between the prevailing capital stock and the anticipated capital stock is bigger, the larger a company's rate of return upon the investment opportunities. Consequently, firms always strategize to close a percentage of this gap between the anticipated(desired) capital stock (K^*) and the extant stock of capital goods remaining from the previous period (K_{t-1}). Thus, the equation of the net investment may be written as:

$$I_t = K_t - K_{t-1} = \lambda (K^*_t - K_{t-1}) \quad (2)$$

Where: K = exact level of capital, K^* = capital stock wanted by domestic organizations, K_{t-1} = previous' capital stock and, λ = partial adjustment coefficient.

If the value of λ greater, implies that less time period required to fill the gap and

thus, the faster will it be for the capital accumulation. This means that if the partial adjustment coefficient (λ) is huge then there is greater possibility that firms are saving more funds to accumulate capital. And as such, it will take them less periods for companies to fill the lacuna between the anticipated capital and existing capital stock. In this model, the anticipated level of capital stock be contingent positively on anticipated gross domestic product growth. This model is a kind of the neoclassical investment representation, as illustrated by Hall and Jorgenson (1967).

Additional investment theory advanced by James Tobin (1967) is called Tobin's q model. Tobin claims firms' investment level be contingent upon the proportion of the current worth of capital installed to the replacement cost of capital. The Tobin q investment theory suggest that, proportion of market worth or value of current capital stock to its replacement cost is the key power promoting investment (Chirinko, 1993, Ghura and Goodwin, 2000). This suggests that companies will wish to invest when upsurge in the market value of an extra unit surpasses the replacement cost. The Tobin's q ratio equals market worth of a firm divided by its assets' expenditure (replacement cost). The q investment theory states that companies will wish to upsurge their capital if q is greater than one ($q > 1$). Thus, a company will buy physical capital, that is, add to the existing capital stock when the $q > 1$. However, there is a decrease in the capital stock if $q < 1$. Besides, when the $q > 1$, companies find it profitable to acquire additional investment (capital) simply because the value of capital is larger than the cost of acquiring the investment (capital). Under this condition, companies reap profits by investing more in capital, and as such the investment is anticipated to upsurge. However,

when the q is less than one ($q < 1$) then, it implies that the current value of the profits gained by installing new investment capital are lower than the cost of the investment. Thus, the cost of installing new investment capital is greater than the interest value of that investment (capital). Hence, the investment is anticipated to be near zero when q is larger than one ($q < 1$). Company would be better off disposing their assets instead of attempting to allowing them to be in operation. The perfect condition is when q is almost equal to 1 implying that the company is in equilibrium. This is also known as universal equilibrium theory (q theory). This is illustrated below as:

$$q = (\partial/\lambda) \quad (3)$$

Where: ∂ = stock market worth of a company, λ = replacement cost of capital.

The q model is viewed as modified form of neoclassical model (Hayashi, 1982) and also as a profit model with the notion that it lays importance on the function of profitability. According to Matlanyane (2005), Neoclassical theory, Flexible Accelerator theory and Tobin's q theory are usually modified and applied to fit the context of developing countries such as the SSA states.

In connection to domestic investment, Rodrik (1991) introduced a policy uncertainty as a variable which determines domestic private investment. He specified that once a policy modification (reform) is announced, there is possibility of the private sector participants to see it as not 100 percent workable. This he said may be owing to the political and economic structure that backed the previous policies may reappear. This may also produce the anxiety that unanticipated events

may result to a reversal. Entrepreneurs usually react to the signals created by policy reforms to enable them succeed in their operation. This will therefore, call for prudent measures to be taken to withhold investment till the uncertainty concerning the ultimate achievement of the reform is removed. Thus, if anticipated loss is huge it may discourage private entrepreneurs (investors) and vice versa. Furthermore, the theory of rational choice influences private investment decisions. This economic theory states that persons endlessly make judicious and reasonable choices which make them achieve the highest benefit. It is an outline (framework) for easy understanding and to officially model social and economic behavior. Therefore, it allows private entrepreneurs to compare the costs of their activity in contrast to gains to enable them take full advantage over loss. Rational choice theorists trust that every human being's decisions as in private businesses are grounded on taking full advantage of their own benefits; whereas lessening what may hurt them. Private entrepreneurs generally adopt rational choice theory into their business operations or models to make them forecast as well as explain future consumer spending choices and as to participate in such business ventures or not.

According to Acosta and Loza (2004), investment theory irreversibility also affects domestic private investment. This theory conditions that the cost of investing in plant and machinery as well as equipment is frequently not recovered by a future resale. Though, constant prices improve the informative content of the price system, permitting a satisfactory allocation of resources. Therefore, for decisions on investment to be made to produce the anticipated results, the uncertainty variable (factors) of those economies (SSA) should be considered.

Thus, any sharp decrease in total demand would create an unmanageable excess in installed capacity (Caballero and Pindyck, 1996). This explains why developed nations with lesser uncertainty achieve higher levels of domestic private investment, as likened to developing nations with a larger possibility of high rate of uncertainty. Inflationary rate is generally applied as a proxy for determining uncertainty (Beaudry et al., 2001).

Once more, domestic private capital formation is delayed due to the limitations on investment financing. According to Loungani and Rush (1995), SMEs are generally not able to finance their own activities directly via open market debts. They however, largely resort to bank credit markets, which usually include market limitations as a result of information asymmetry that exist amid moneylenders (creditors) and debtors (borrowers). Developing nations are normally confronted with the challenge of obtaining credit due to the absence of futures market. This creates poor medium of obtaining long term funds. So, the price of the asset and the nominal gain on the investment may fall. This consequence turns to be mostly appropriate in sectors producing goods which cannot be exported.

Furthermore, some economists argued that most of these conventional theoretical models were developed for industrialized and advanced countries. Despite the fact that these models identified various set of determining factors of domestic private investment in the developed economies; when applied in their original states to the developing economies, they pose many theoretical and empirical challenges. They further stated that these challenges or problems were

peculiar features to institutions, markets and technologies in those economies. Therefore, recognition of these problems results to many modifications of those models to ensure conformity to the emerging countries' context. The principal purpose is to find and measure the relevant determining factors of domestic private investment in the developing economies. Again, these modifications are created to close the gap between true (unadulterated) investment theory and the inimitable institutional and structural features of the developing countries (Tybout, 1983; Sundararajan and Thakur, 1980; Shaw, 1973; McKinnon, 1973).

Therefore, according to Lim (2013), it is necessary to consider the institutional factors of developing countries on the notion that it may have adverse effects on determinants of the investments in such economies. His argument is based on the premise that developing countries such as Sub-Saharan Africa countries' past and present political history of civil unrest and wars may serve as deterrence to domestic investors whether in a form of FDI. Therefore, present economic research needs to consider institutional factors with regard to how they will affect investment in such economies.

Congruence to the above challenges caused by the traditional investment theories, the new modifications and empirical appeal created a framework which considered factors that were not included in traditional theories of investment, although arguing for the vitalness of traditional indicators as output, relative prices and interest rates, institutional variables (Badawi, 2005; Lim, 2013).

Empirical Modification of the Conventional Investment Theories.

The modification of traditional theories was recommended by many authors who used them to suit numerous contexts of the developing economies. According to the following authors, Bhattacharya et al (2004); Fazzari et al (1988); King and Levine (1993); Tybout (1993) and Wai and Wong (1982), in their modification of the neoclassical investment theory, recommend the addition of banking sector credit and the financial intermediation size as some of the vital determining factors of domestic private investment. Addition of these variables into the modified investment theory, implies that information asymmetry and moral hazard problems usually fault capital market in the emerging economies. They applied interest rate to mean “screening device” to categorise good debtors (borrowers) from bad ones.

Furthermore, Stiglitz and Weiss (1981), oppose the indirect limit of interest rate. They indicated that some proportion of the debtors is credit rationed notwithstanding some credit being pertinent for investment equations.

Besides, public sector investment as a factor was introduced into conventional investment theories when considering the developing economies without exception to Sub-Saharan African countries (SSA). This fundamentally, was as a result of the nature of political administration and public enterprises prevailing in the developing nations. The existing literature examined either explicit or implicit impact of public expenditures on domestic private investment (Von-Fustenburg and Malkiel, 1977; Galbis, 1979; Sundararajan and Thukur, 1980; Blejer and Khan, 1984; Chhibber and Van Wijnbergen, 1988; Aschaur, 1989; Moshi and Kilindo, 1999; Asante, 2000; Ouattara, 2002; Badawi, 2005).

According to Sundararajan and Thukur (1980), crowding-out effect seems believable in economies in which government involved various economic activities. They carried out empirical studies on India and Korea. Their study produced conflicting results. They found negative long-run multiplier consequence within India and positive multiplier impact in Korea. Economists further argued that in some countries, public capital investment helped to remove all possible problems that would limit private sector capital formation (investment) and ensure private sector expansion, serving as a complement to the growth of the private sector. Ermisch and Huff (1999) in the situation of Singapore, Lee (1991), Nigeria scenario, Shafik (1992) studies done in Egypt, and Wai and Wong (1982) examination on Greece.

Furthermore, Sakr (1993) undertook a study in Pakistan to study factors of private investment with importance for public investment. He used an investment (capital) function and annual data from 1973/74 to 1991/92. His results indicated that private investment in Pakistan is positively associated with credit to the private sector, gross domestic product growth and public investment especially within infrastructural projects. Molapo and Damane (2015) analytically surveys the determinants of private investment in Lesotho from 1982 to 2013 using ARDL Error Correction Model (ECM) and indicated that economic growth and public investment positively affect domestic private investment whereas price increment negatively influenced it. Ribeiro and Teixeira (2001), analyses the main determinants of private-sector investment in Brazil from 1956 to 1996 and employed autoregressive distributed lags (ADL) model. They indicated that

domestic private investment across nations is fundamentally influenced by real interest rate, public capital investment, the exchange rate, domestic output, credit availability for investing in businesses, magnitude of external debt, and macroeconomic stability. Besides, Asante (2000), uses time series examination with cross-sectional study to find out determining factors of domestic private investment in Ghana. His study disclosed real credit to private sector was statistically important and have positive impact on domestic private investment formation.

Besides, Froot and Stein (1991), McCulloch (1989), Buffie (1986), Chhibber and Shafik (1990), Faini and Demelo (1990) and Krugman and Taylor (1978) contended that devaluation policy should be included in the investment equation. They argued that devaluation has effect of incentive to motivate domestic investment and its profitability in tradable goods sectors. They further stated that devaluation does not only favour the export sectors but also enable foreign companies to acquire local assets at a lower price to augment investment. These economists point out that a country's currency depreciation could also explain the rate of domestic private investment in the developing nations. Therefore, they centered on the inclusion of exchange rate policy into the model as a variable which is important to stimulate domestic private investment.

Again, Frimpong and Marbuah (2010) undertook a study to unearth the factors that crowd-in and crowd-out domestic private investment in Ghana from 1970 to 2002 and employed unit root tests, co-integration and error correction techniques with Autoregressive Distributed Lag framework. They found out private

investment positively related to real interest rate, inflation, public investment, real exchange rate, trade openness and a regime of constitutional rule in both short and long runs. Although, external debt adversely influenced private investment. Their study indicates that excessive external debt crowd out domestic private investment. Thus, an economy where debt stock is high, it discourages investors to invest.

Ouattara (2004) also examined factors that impact domestic private investment in Senegal from the period 1970 to 2000 via long run private investment equation obtained applying Johansen co-integration methods with bounds test method. After testing indicators for unit root using Dickey-Fuller generalized least square detrending test and Ng-Perron test, his outcomes show domestic public investment, real income (output) and foreign aid flows positively influence domestic private investment, whereas effect of credit to private sector and terms of trade adversely influence domestic private investment. Ouattara's result signifies that credit to the private sector crowd- out domestic private capital formation in Senegal. This is against some empirical evidence in some existing literature.

Cruz and Teixeira (1999) examine effect of domestic public investment on domestic private investment in Brazil from 1947-1990 via assessment of an investment function grounded on the theory of permanent investment in situations of uncertainty by using Dickey-Fuller test. They concluded that domestic public outlay crowd-out domestic private investment in the short run; whereas the two indicators complement each other in the long. Another study was done by Jongwanich and Kohpaiboon (2008) to investigate the trends and factors which influence domestic private investment in Thailand from 1960 to 2005 used

Augmented Dickey-Fuller (ADF) test for Unit Roots. They assessed the domestic private investment equation functional form founded on the extended method of neoclassical investment theory where cost of capital, output growth, economic uncertainty, real exchange rate, availability of capital funds and domestic public investment are included. Their result shown that in the short run, domestic private investment in Thailand relate positively to real private credit, output growth and existence of spare capacity. However, in the long run, domestic private investment was directly influenced by real exchange rate which depicts the nature of export led growth in Thailand.

Le (2004) undertook panel studies of twenty-five (25) developing nations with the emphasis upon economic and political factors which affect private investment for 21 years. The study utilised pooled cross-section time-series analysis and conclude that socio-political stability surrounded by peaceful protest encourages investment although violent revolutions stop domestic investment. Additionally, the study further indicates that constitutional government alteration helps domestic private investment to upsurge whereas military government prevents domestic private investment form expanding. Brunetti and Weder (1998) investigated association amid private investment cum institutional uncertainty by applying comparative investigation of 24 uncertainty indicators verified on a set of 60 nations. To allow contrasts of the findings across nations, the study tested procedures of institutional uncertainty in investment utilising similar conditions, from 1974 to 1989. The study disclosed nonexistence of rule of law, huge corruption presence and instability of real exchange rate as the most harmful

variables for domestic investment. Additionally, capital accumulation by the private sector was positively determined by well-planned financial and credit markets while considering fiscal sustainability.

Furthermore, Iyoha (2000); Dooley (1986); Krugman (1988); and Sach (1989), have attempted to spread the set of outside limitations to domestic private investment in developing nations. These authors added an economy's indebtedness as percentage of GDP as one of the regressors in the modified investment equations used. They argued that excessive debt discourages domestic private investment ingenuities and as such prevents productivity augmentation and projections for future growth and affluence.

In addition to the observational factors (determinants) that have been used in the modified investment equations, some authors argued that investment does not only respond to such determinants, rather sensitive to macroeconomic and institutional backgrounds where these determinants interrelate. Macroeconomic and institutional variables are vulnerable to regular socio-political and economic variations in emerging nations, a substantial experimental literature tried to draw or sketch an investment uncertainty association. In this spirit, macroeconomic stability received prime attention with the opinion that macroeconomic instability emphasizes the unfavorable impact on private investments (Aryeetey, 1994; Pattilo, 1997). However, it is important to highlight the foundation on which the above-mentioned arguments proposed in the modification of the conventional theories of investment are based to explain some of them within the parameters of policy framework.

Institutions and Classification Systems

Institutions are defined as “the rules of the game”. Thus, they are humanly planned limitations which put together human being’s interaction. These consist of formal (constitution, rules and regulations, laws, property rights), informal (norms of behaviour, taboos, customs, sanctions, self-imposed codes of conduct, conventions and traditions) limitations which facilitate political, economic and social outcomes and their enforcement characteristics.

The commonly and generally acclaimed and used definition of institutions is accredited to Douglas North. He therefore, defined institutions as “formal and informal rules of the game, and their enforcement characteristics” (North, 2005a, 1993, 1990). North (1993), differentiates institutions from organizations, which are the players of the game; be it firms, individuals, corporations, organizations or any other definable social construct or idea. According to him, game is deemed as any social interaction. His explanation of institutions in this respect comprises of provision which considers institutions as all rules and regulations or forms of conduct, developed to help decrease uncertainty in either business environment or the entire society. This also assist in regulating the environment or the game and hence, decreasing transaction or production costs (Menard and Shirley, 2005). This implies that institutions are social constructs to shape human behaviour. Thus, be it individuals, firms and organisations; these rules when properly implemented, will help to improve their profitability. According to Coyne and Sobel (2010) employed panel unit root test and Augmented Dickey-Fuller (ADF) test from 1970 to 2005 and concludes that the existence of good institutions decreases uncertainty and the

cost of doing business via their effect on production and transaction costs. Thus, good institutions provide investment atmosphere for both domestic and foreign investors to do business. Countries which did not provide conducive atmosphere for the implementation of good institutions, usually confront challenges with regard to improvement in domestic private investment.

Furthermore, Ostrom (2005) also defined institutions as “sets of working rules that are used to determine who is eligible to make decisions in some arena, what actions are permitted or inhibited, what accumulation of rules will be used, what procedures must be followed, what information must or must not be provided, and what pay-offs will be assigned to individuals dependent on their actions”. The Ostrom’s thought of “arena” in his definition is similar to that of Douglas’s idea of a game. Despite, commonality in the definitions of institutions which are generally acknowledged in the scientific community, differences still remain in terms of how to properly categorise everything, that can be well thought-out to be part of the institutional environment. Institutions according to North (1993), Williamson (2000) and Ostrom (2005) can be classified into three as subject category, degree of formality and degree of embeddedness.

Joskow (2008), in his new institutional economics guidebook, define classification of institutions on subject category to mean legal, political, economic and social institutions although it would be faultlessly prudent to place the organizational institutions in companies into different group. Legal institutions are simply the greatest general kind of institutions, or it is an additional arrangement of legislature that can be found in virtually or practically any kind, but most primitive,

social interactions. There is a difference between public planned legal institutions, and private legal institutions, that are usually acknowledged in contracts.

Legal institutions are also termed as formal institutions depending on the degree of formality in their functions (classifications). There are variety of issues as to why legal or formal institutions are very vital. Some of the serious matters consist of the backgrounds or origin of legal structure and their impacts, property rights, and implementation of legislation. Political institutions in this sense take into account a wide meaning to comprise the electoral rules, voters, political parties and rules that prevents a government or nation from doing something that are not in laid down rules or standard. Furthermore, economic institutions usually interconnected to a great degree by the legal institutions. Institutions therefore, are required to protect a correctly working market, these are legal structure (system), implementation of property rights or contracts, some parts of rules and regulation and so on, to ensure that domestic investment is safe from harsh institutional environment. Any economy which has a market friendly institutional environment, will serve as beacon of hope for domestic private investment to thrive. This is so because, the investors will not be afraid of eventualities in the future. Social institutions on the other hand, made up of beliefs, norms, faith or beliefs, customs, civic cooperation and agree fundamentally with informal institutions in the degree of formality in classification.

Furthermore, classification regarding degree of formality, there are two unique sets that are needed to be considered as formal and informal institutions. This arrangement or classification depended upon Douglas North's explanation of

institutions and frequently applied in universal applications or submissions (tenders). Formal institutions largely, are laws (as statutory or common law or both), rules and as well as other regulations that persons directly subscribe. Informal institutions however, consist of norms, taboos, conventions, codes of conduct, faith or beliefs etc. These are rules and regulations that are not visibly written down, hence are beneath the social surface. Besides, the difference of institutions is either constitutional rules (thus, constitution and basic legislation), operating or working rules (legislation) and behaviour rules (intended to legitimise the first two sets) North (1981). Therefore, first two sets are the formal institutions and the third as informal institutions.

Regarding degree or extent of embeddedness (fixity), Williamson (2000)'s classification or arrangement of institutions is the interconnecting nature amid formal and informal institution with the idea of entrenchment or fixity of institutions. The arrangement of institutions based on the entrenchment (embeddedness) has to do with the ease with which the rules can change. With this arrangement or classification, institutions are clustered (grouped) in four stages. Here, the lower stages of institutions are more entrenched (embedded). This stage or level change more gradually as compare to higher stages or levels of institutions.

The institutional stages or levels are discussed as follows: Stage one (1) is the level where institutions are completely informal. These include traditions, customs, norms, conventions and religion. Stage two (2) is situation whereby the institutions or institutional environments are less embedded (entrenched). Thus, at this level of institutions changes so easily as compared to level one (1) which is

informal in nature. Generally, stage 2 is defined as “formal institutions or formal rules of the game, these rules particularly compose of property rights, judiciary, polity and bureaucracy”. Stage three include “institutions of administration (governance), whereby administrative or governance structures are connected through transactions, specifically contracts with their transaction costs”. Lastly, stage four is defined as the “institutions that are rules which govern (oversee) resource allocation and employment”. This uses neoclassical marginal ideologies or values to maximise or make the best use of certain aims. Williamson (2000) argued that each higher stage changes more gradually as compare to lower stage. The projected or anticipated frequency for changes to occur at the first stage is from 100 to 1000 years. However, from 10 to 100 years before changes can be made to the second level. Also, from 1 to 10 years, changes can also be done to the third stage. Although, changes can be done at fourth stage on a constant basis, Moreover, since stages are entrenched in one and another, every institutional stage is controlled by former lower (more entrenched) stage. There can be response from higher to lower levels as well, although the first constraining association is much stronger. These levels may affect negatively domestic investment and there is the need to ensure that the institutions are robust and investment friendly to boost domestic investment particularly in the developing nations as Sub-Saharan African countries. This is so because changes in these institutions especially at level four if negatively, will jeopardise the business environments particularly in the developing countries as SSA. The continuous change in the rules at this level usually affects

domestic investments destructively. Since the changes in these rules of the game, are done to suit just some few business tycoons.

Furthermore, concerning the appropriateness of theoretical arrangement for a selected area of examination, for any empirical (practical) application, one need to consider the possibilities of conceptualizing the selected theoretical concepts or ideas. Therefore, based on that, the classification (arrangement) of institutions of Williamson (2000) can be concentrated upon three comparatively homogenous groups of institutions of subject category classification based on (Joskow, 2008) as legal, political and economic. The motive for not including social and organizational institutions is because, these institutions can be clustered into the first and or the second groups are still too heterogenous for the groups to be thought of as representing a common fundamental measurement. Moreover, for the first three (3) formal subject groups, accessibility of variables both across nations as well as in time is much better than for the social and organizational institutions. This means that there are few empirical proxies, and even less than are internationally comparable.

Institutions, FDI and Sources of Domestic Investment Finance

Some authors in their literature disclosed institutions as very important determining factor of foreign direct investment and domestic investment in emerging nations (Blonigen, 2005; Dawson, 1998). For instance, several authors have indicated in their studies that political instability produce adverse and statistically important effect on domestic investment in emerging countries (see Rogoff and Reinhart, 2003; Gyimah-Brempong et al., 1999). Besides, (Wei and

Wu, 2001; Mauro, 1995; Campos et al., 1999;) also argued out that corruption connected through poor governance (institutional practices) upsurges production costs and depresses domestic investment. According to Coyne and Sobel (2010), the existence of good institutions decreases uncertainty and cost of doing business via the effect on the production and transaction costs and hence improve factory productivity by encouraging investments. As indicated in the existing literature, property rights protection decreases risks and surges domestic investment (Li and Resnick, 2003). Besides, Daniele and Marani (2006), indicated that FDI contains huge sunk costs, therefore, social and political instability, uncertainty of the environment, lack of enforcement or implementation of the property rights and the efficiency of the legal system have negative effect upon FDI inflows. However, according to Hausmann and Fernández-Arias (2000), in their meta-analysis, indicated that the portion of DFI in total capital flows becomes greater in nations which are dangerous (riskier), economically (financially) underdeveloped and institutionally feeble. Thus, the portion of FDI in an investment within domestic economy, may not be a dependable forecaster of the presence of good institutions. This therefore, depends upon the type of FDI inflows into an economy.

Dalmazzo and Marini (2000), pointed out that political regimes, have the possibility to determine the policy posture to markets and incentives or help to be provided to the private sector. They further argued that governments which are to a large extent market-friendly and helpful to the private sector, are more likely to attract private entrepreneurs. They again said that the choice of investment finance depends upon the political uncertainty. This could be market-friendly and or market

unfriendly. Market friendly is where the populist (democratic) government coming to power whereas market-unfriendly is the regime where there is a high possibility of undemocratic government coming to power.

Dalmazzo and Marini (2000), said that there are 3 dissimilar sources for funding investment under political uncertainty. These include the domestic capital self-financing (DSF), foreign direct investment financing (FDI) and foreign debt financing (FDF). They stressed that when a politically unstable or military government is in power, the implication is that private entrepreneurs (investors) would try to find foreign financiers or partner who can exercise pressure on the government to defend the value of the investment in the domestic country. This situation implies that the institutional variables are not robust and hence domestic investors want foreign partners in order to protect their investment domestically.

In addition, the local entrepreneurs may prefer partnering with foreign partners; because they can impose sanctions on a country whenever some international contracts are dishonoured or broken. Therefore, the domestic entrepreneurs are likely to partner with foreign investors or financiers; to offer them some kind of protection in case a market-unfriendly government attain political power. This implies that the more possible is a market-unfriendly government attaining power, the better the motivation for foreign financing over domestic financing.

Furthermore, Dalmazzo and Marini (2000) expatiated that when a local investor sells a venture to a foreign entrepreneur and market-unfriendly (military) government assume power, the foreign entrepreneur can request the application for

trade sanctions against the nation. Also, when an investor borrows money from abroad to finance the project (FDF) locally and a military government assumes power, slight effort of rejection of the outstanding debt obligations makes the country responsible for sanctions. Capitalist (free enterprise) therefore, remains in full control of the project or the populist government resolves to default, which may lead to sanctions. In that case, the capitalist (domestic entrepreneur) has larger negotiating power compared to domestic financing. According to them, it is good to borrow money from abroad or foreign financial institution to finance project in the domestic economy than borrowing from the home financial institutions. Most especially when market unfriendly government comes to power. The reason being that when market unfriendly government destroy project of a foreign investor, that government will be sanctioned. This benefit is not available to the domestic investor who borrow money from the domestic financial institution.

Agosin and Mayer (2000) claimed that the influence of FDI on total domestic investment depends upon numerous factors, together with beneficiary nation business environment and economic policy; kinds of foreign direct investment and the strength of domestic companies. Nevertheless, it is also affected by the affiliation between foreign direct investment and domestic private investment. They indicated that if the FDI is in the form of high technology, it would generally have a favourable crowding in influence on domestic investment. c used panel data spanning from 1990 to 2000 with Wald test and stated that foreign if direct investment in a country competes with the domestic companies; then it has the potential to decrease investment chances for domestic investors. This would

mean that the contribution towards total capital formation of that FDI in the domestic economy possibly is less than the FDI inflow itself. This they say may amounts to crowding-out consequence on the domestic investment. Situation whereby the foreign direct investment may not able to displace private investment, it may also not be able to encourage new downstream or upstream production and hence may not positively impact domestic private investment (Agosin and Machado, 2005). Therefore, the possible spillovers or overflows from foreign direct investment to the domestic companies may not be enough to encourage domestic private investment. According to Almeida and Fernandes 2008, the influence of foreign direct investment to technology transmission may be mostly limited to subsidiaries and the overflows may not meaningfully enhance competence of domestic companies (Girma and Gong, 2008).

According to Nunnenkamp (2004) countries which have good governance indicators or good institutional factors such as low corruption, political stability, robust property rights and so forth to a greater extent will impact positively on domestic private investment. He stated that the stages of domestic private investment and FDI would be larger in nations where there are good institutions as compared to poor governance indicators or institutional factors. Nevertheless, it is evidence in the existing literature that FDI has either positive or negative influence on domestic private investment. This therefore, depend upon the strength and ability of the local manufacturers to contest with, succumb to or absorb overflows or spillovers from FDI and the form of foreign direct investment such as resource extraction or export manufacturing. Nunnenkamp (2004) further, stated that strong

relationships between private investment and FDI will strengthen the crowding-in effect. He continued that the crowding-out is highly possible when foreign direct investment is in the form of Mergers and Acquisitions (M&A).

Much of the research work carried out to assess effect of foreign direct investment on the stage of private investment for emerging nations is grounded on cross-country data. Furthermore, Borensztein et al. (1998), examine effect of foreign direct investment on domestic investment for 69 emerging nations from 1970-89. Their findings indicated that foreign direct investment encourage total investment. Thus, FDI crowds-in domestic investment. This implies that if FDI increases, the domestic investment also increases. The findings are not however strong to model specification. Agosin and Mayer (2000), developed a model of investment in emerging nations to study the long-term crowding-in and crowding-out impacts of foreign direct investment on domestic investment. After Agosin & Mayer developed their model of investment to test the long-term effect of FDI on Domestic investment, Agosin and Machado (2005), employed GMM to estimate and test panel data from 1971–2000 with a model for Africa, Asia and Latin America and indicated that foreign direct investment dislocates domestic investment in Latin America. Nevertheless, in Africa and Asia the overall investment upsurge by the quantity of the foreign direct investment.

The following authors Agosin and Machado (2005); Mišun and Tomšik (2002) and Agosin and Mayer (2000) concluded in their studies that positive effect of FDI on domestic investment is not guaranteed. Especially in a situation where overall private domestic investment surge less than the FDI inflow, mostly in the

developing countries as discovered. Udomkerdmongkol and Morrissey (2008) used annual aggregate data for 36 low- and middle-income countries from 1995-2001 to examine impact of foreign direct investment FDI on domestic private investment. Their studies take into account particularly, how the political government (regime) or institutional factors might have influenced the association between domestic private investment and FDI. The results recommend that good governance or institutions encourages both private investment and FDI.

Institutions and Domestic Investment

Kurul and Yalta (2017), Yerrabati and Hawkes (2016), Farla et al. (2013), Adams (2009) and Borensztein et al. (1998) indicated in their works that for most countries in the developing world to attract more international and domestic investors, it is dependent upon them to improve their institutional system. According to Morrissey and Udomkerdmongkol (2012), they argued that overall investment (thus, FDI and domestic private investment) is higher in countries with good institutions. In the works of the following authors, they have indicated that political instability, corruption and legal uncertainty have a adverse and statistically important influence on domestic investment (Nunnenkamp, 2004; Li et Resnik, 2003; Rogoff and Reinhart, 2003; Wei and Wu, 2001). Therefore, it is generally acknowledged that poor or weak institutions may lead to a rise in the transaction and production costs which may serves as a risk to dampen the investment interest of both the domestic and foreign investors.

However paradoxically, some authors disclosed that some countries with poor institutions (that is countries having weak institutions and highly dangerous

business climate) have attracted significant foreign direct investment inflows (Giang, 2017; Wang, 2009; Hausman and Fernandez-Arias, 2000). In similar way of thinking, Li and Resnick (2003) employing pooled time series cross-sectional analysis from 1982 to 1995 on the Reversal of Fortunes: democratic institutions and FDI inflows to developing countries, also argued that democratic institutions have uncertain effects on FDI. This situation was explained with a body of arguments. They pointed out that, poor or weak institutions and high levels of corruption in a country do not imply that foreign and domestic investors cannot protect their investment interests. They further disclosed that foreign investors and foreign multinational corporations generally, give gifts to local authorities (government officials or agencies) in exchange for their favours to enable them protect their property rights or financial benefits in those risky business environments (Meon and Sekkat, 2005; Li, 2005; Wang, 2009). Furthermore, their line of argument is predominant in some SSA countries. Thus, some multinational companies from the developed countries, commonly offer gifts to government officials in some of these countries in order to protect their businesses despite the unhealthy nature of the institutional variables.

Many experientials (empirical) studies try to study affiliation between institutional variables and domestic investment (be it FDI or domestic private investment). Several authors pointed out that institutions produce positive effect on domestic investment. So, in examining FDI and institutional quality of over 164 countries from 1996 to 2006, Buchanan et al. (2012) demonstrated that institutional (governance) quality has an important and positive influence on domestic

investment. According to Globerman and Shapiro (2002) when countries invest adequately in institutions or governance, it helps them place their business environment in position to attract more capital, and as well offer an opportunity to their domestic multinational corporations to invest abroad. Akanbi (2010) employed Johansen estimation method to the data from 1970 to 2006 for Nigerian economy, and found out that well-structured and constant or stable (unchanging) socio-economic atmosphere encourage investments over the long run. Nevertheless, there are some empirical studies which indicates negative affiliation between institutions and investment. Bellos and Subasat (2012a, 2012b, 2013) found out that poor institutions or governance also serve as an incentive which attracts foreign multinational companies to transition economies and Latin America. Alam, Kiterage and Bizuayehu (2017) employed System Generalized Method of Moments method to survey the effect of government effectiveness (GE) on economic growth of a panel of 81 nations and find out that GE produced a positive impact on economic growth.

Foreign Direct Investment and Domestic Investment

Foreign direct investment has varied definitions. According to IMF (1993), “Foreign direct investment is an investment intended at obtaining lasting interest in companies working outside the home nations of the foreign investor”. Besides, FDI could also be understood from the perspective of the investor’s objective to get a substantial degree of influence in the managing board of the business. Grounded upon the International Monetary Fund (IMF)’s definition of FDI, the Organisation for Economic Cooperation and Development offers an additional clarification that

foreign direct investment “reflects the objective of a resident entity in one economy to obtain a lasting interest in an enterprise resident in another economy” (OECD, 2001). Here, the lasting or permanent interest means long-term affiliation established amid the direct investor and the direct investment firm.

Furthermore, there are other associated definitions that also needed to be explained as well. Direct investment enterprise is viewed “as a branch (outlet) or subsidiary established from direct investment” (IMF, 1993). According to Duce (2003), it is commonly acknowledged that at least 10% of equity possession or ownership is needed for an entrepreneur (investor) to qualify as a foreign direct investor. Thus, both International Monetary Fund and Organisation for Economic Cooperation and Development endorse the use of the 10% by means of a benchmark (standard) to differentiate direct investment from portfolio investment in the form of shareholdings. Principally, the aim of foreign investors or entrepreneurs to take control over a business venture is the greatest vital feature of foreign direct investment which make it quite distinct from foreign portfolio investment. Again, OECD (2008) defined a branch as “unincorporated or an independent direct investment enterprise in the host country fully owned by its direct investor” whereas subsidiary “is an incorporated (combined) enterprise in which an investor possesses more than 50% of its voting power”.

Foreign direct investment may influence domestic investments in many ways. In actual fact, FDI can produce complementary effects of crowding in and or the substitution effects of crowding out on domestic investment. These effects may arise from more than a few factors or conditions in a specific business environment.

These may include; the specifics of the FDI, strength of local companies and orientation of economic policy. Furthermore, regarding the type of FDI which displace or crowd in domestic investment, Ashraf and Herzer (2014) surveyed the impacts of greenfield investment and M&As on domestic investment using panel data for 100 developing countries from 2003 to 2011. They pointed out that M&A do not have negative influence on domestic investment, although greenfield or completely new inflows of foreign direct investment seems to have a displacing impact on domestic investment. In the similar manner, Agosin and Mayer (2000), stressed that the connection between purchases (acquisition) of domestic companies by foreign multinational companies and actual investment cannot be substantiated. However, in the framework of intensively competitive sector, an invasion or influx of foreign firms in the domestic economy, might take away the possible investment opportunities which formerly were available to domestic investors. Besides, the foreign multinational companies which invest directly in countries other than theirs, turns to displace (crowd out) domestic private investment, in sense that they have improved financial stands than the local firms. Again, the crowding effects become intensive when the foreign companies compete directly with the local companies in the similar or same businesses.

Undeniably, the existence and the actions of international companies lead to some vital changes in the domestic market which affects the activities as well as the stability of the indigenous companies. Accordingly, the complementary impact is explained by many mediums, particularly the positive externalities, the infrastructures, the connection effect, upsurges in domestic demand for goods and

services; and more commonly wider nature of business opportunities available in the home economy or country (Moran, 2011; Görg et Greenaway, 2004; Cardoso and Dornbusch, 1989). The substitution effects however, emanate from different mediums, these include surge in domestic interest charges or rates and costs of inputs, borrowing funds by the foreign multinational corporations from the domestic financial markets, the disincentives for domestic investment owing to dangerous and unfair competition by the foreign firms, and the spread of barriers to market access. (Harrisson and Mcmillan, 2003; Agosin and Mayer, 2000; Markusen and Venables, 1999; Aitken and Harrisson, 1999). Furthermore, total influence of FDI on domestic investment will contingent upon the comparative strengths of the two effects of complementary and substitution. Some authors in their studies, endeavoured to study the validity of the association between foreign direct investment and the domestic investment in some developing nations. Ndikumana and Verick (2008), used a panel model (Fixed effects estimation technique) and data on sub-Saharan countries, and found out that foreign direct investment displaces domestic (local) investment. Furthermore, Agosin and Machado (2005), used GMM estimator for a panel of 36 nations (12 each from 3 regions, that is Africa, Asia and Latin America spanning 1971 to 2000, the result indicates that foreign direct investment crowd out domestic or local investment in Latin America. However, in both Africa and Asia, foreign direct investment has increased total investment. Again, Eregha (2011) used a panel cointegration estimation method to a data from ECOWAS dated 1970-2008 and resolved that FDI has displaced domestic or local investment.

Besides, the works of the following authors (Mutenyo et al., 2010; Kokko et al., 1996; De Backer and Sleuwaegen, 2003; Agosin and Machado, 2005; Aslanlglu, 2000; Grether, 1999; Morrissey and Udomkerdmongkol, 2008; 2012; 2016) have adopted system (GMMS) of Blundell and Bond (1998) to study association between foreign direct investment and domestic private investment, and also to analyse the impact of alternative elements of governance on West African Economic and Monetary Union (WAEMU) from 2002 - 2015. Their result indicated that, the negative association between foreign direct investment and domestic private investment can be explained as due to large technological gap that occurs between domestic firms and foreign ones. They further argued that the crowding out effect would be that the local government offers more facilities to the foreign companies as compared to the domestic firms. For example, these foreign investors may be given tax exemption on imported plants and machinery, access to loan, free land and other compensations which could negatively affect domestic firms' competition with the foreign ones.

According OECD (2002), FDI assist countries to enhance economic development via getting modern technology from the foreign entrepreneurs, generating new jobs and improving labour force via training. Besides, FDI aids governments to upsurge their revenue base, invest in capital and participate in the global economy to increase Gross Domestic product. FDI again, assist country to expand the economic and business environment which will indirectly lead reduction of poverty (Giang, 2017).

Furthermore, many studies disclosed that FDI inflows have positive impact economic development. One of the earliest studies of Findlay (1978), indicated that FDI carries contagious impact which assist to enhance the technological development in the domestic nation. Caves (1996), also discloses many merits of FDI for economy that receive it comprise increasing the productivity, introducing management knowledge and labour training, transferring new technologies and processes.

Interaction between Institutions, FDI and Domestic Investment

The effect of FDI inflows on the domestic or local investment is contingent upon the institutional variables and the business climate of the host nation. These effects are substitution and complementary of the FDI on domestic investments which are more or less improved by the level of institutions. Udomkerdmongkol and Morrissey (2012) employed GMM estimator (Blundell & Bond, 1998) with a panel data from 1996 to 2009 and disclosed in their studies, that among the alternative indicators of institution, political stability affects particularly the association between FDI and domestic private investment in the developing nations. Most especially, countries with improved institutions or governance and improved political stability have a higher likelihood of crowding-out of private investors by the investment activities of the foreign investors. Furthermore, Farla et al. (2016) reviewed the work of Morrissey and Udomkerdmongkol (2012) and formed contrary views. They concluded that FDI inflows displace domestic investment in a situation of good institutions. However, as a matter of fact, in rejecting the disapproval of Farla et al. (2016), the authors Morrissey and

Udomkerdmongkol (2016) have confirmed the result of their earlier work. They indicated that the influx or invasion of foreign investments can result into positive spillovers on the domestic economy with good institutions. This means that the spillovers or overflow of the FDI to the domestic companies is affected by the status of institutions in that country. Therefore, countries with poor or weak intellectual property rights protection (that is bad institutions or governance), may cause foreign investors or entrepreneurs to limit or reduce their new investments in that country. Consequently, the reduction in the positive overflow decreases the crowding-in impacts of FDI on domestic investment (Farla et al., 2013; Crespo and Fontoura, 2007). Sabir, Rafique and Abbas (2019) employed system (GMM) with a panel data for low, lower-middle, upper-middle and high-income nations from 1996 to 2016 investigate the effect of institutional quality on Foreign Direct Investment inflows. Their results disclose that institutional quality produced positive effect on foreign direct investment in both developed and developing countries.

Their findings also indicated that the coefficients of control of corruption, voice and accountability, rule of law, political stability, regulatory quality and government effectiveness for foreign direct investment influxes are larger in developed nations than in developing nations. This means that countries with good institutions, will serve as a catalyst to attract more foreign investors to invest in those economies. Gangi and Abdulrazak (2012) employed fixed and random effects techniques with a panel data of 50 African countries from 1996 to 2010 and

concluded that voice and accountability, government effectiveness and rule of law all influence foreign direct investment positively in African countries.

Diaz-Cayeros (2013), Amsden (2007) and Farla et al. (2013) argued that countries which have high levels of elite rent seeking behaviour (thus, bad institutions), usually make FDI to exercise crowding out influence on domestic investment. Owing to the fact that, the foreign multinational companies grasp a huge part of the local market by excluding the domestic investments. Likewise, political uncertainty causes the domestic entrepreneurs to search for foreign partners or lenders in order to fight against unnecessary exploitation or abuse by the home governments. Thus, the presence of the foreign investors in the domestic economy, deters the home government from going contrary to the protection of their property rights. Nevertheless, Farla et al. (2013) noted effect of rent seeking behaviour on the overall investment to reduces the domestic investment due to the fact that those corrupt practices by the government officials might result in the influx of foreign investments in the domestic economy. Therefore, the fall in the domestic investments owing to the bribes or rents collected by the government officials could cause the rise in foreign direct investment. Another line of thinking is also that, the economic and political elites rent seeking behaviour could also reduce FDI. This may result when domestic elite collect huge rent by controlling some industrial sectors, which would frustrate foreign investors from investing in the domestic market. Hence, the barriers to foreign investments created through huge rent collected, contribute indirectly to the growth of the domestic private investment.

External Debt Overhang and Capital Formation

According to Claessens et al. (1996) the influence of external debt overhang on domestic private investment and on macroeconomic performance of developing countries are generally examined within the context of ‘debt overhang hypothesis’. This hypothesis suggests that if a country’s external debt surpasses its repayment capability through some possibility in the future, it implies that the anticipated debt repayment is expected to reduce country’s output level. This however, means that some of the revenues from investing in the domestic country are effectually taxed away by the current foreign creditors and hence the investment by domestic or local and new foreign creditors are discouraged.

Abdullahi, Abu and Hassan (2016) employed Autoregressive Distributed Lag (ARDL) with time series data from 1980 to 2013. They indicated in their work, debt overhang versus crowding out effects that external debt specifically is a necessary evil that all economies to survive with. They further pointed out that external debt knowledges in Sub-Saharan Africa countries have adversely affected domestic private investment in the region.

Seyram, Matuka and Dominic (2019) employed two-step system (GMM) method with panel data of 48 SSA from 1990 to 2017 on external debt and economic growth. They concluded that external debt produced negative and statistically significant impact on economic growth.

Some authors further throw more light on the hypothesis that a reduction in a nation’s external debt will cause an increment in the domestic private investment as well as an increase in the payment ability of the country. Therefore, debt

overhang depresses domestic private investment. This is so because government would be anticipated to increase the fiscal revenue required to finance external debt repayment or service, and hence generating doubt or uncertainty among private entrepreneurs or investors. Besides, the large amount of debt burden on the economy, would mean that government would have to commit large percentage of the export revenue to service debt. Thus, siphoning the little resources that possibly would otherwise have been utilised to finance domestic public investment and hence will complement domestic private investment and growth (Cohen, 1993), Serven and Solimano (1990a, 1990b).

Krugman (1998) and Sachs (1989b) also indicated that large external debt of government usually has potential to reduce domestic private investment. They further argued that, external debt to government serves as a source of macroeconomic instability since it depends mostly on world interest charges or rates and terms of trade. These factors are beyond the control of the debtor country and as such instability will automatically impacts policies on the private sector capital formation.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter presents the methodology of the study. This includes the research design, model specification, variables description and measurement, data sources and sample size, and the estimation techniques. Data analysis tools are also included in this chapter.

Research Design

In any longitudinal investigations, the research design might be quantitative, qualitative or mixed contingent on the purposes of the study. This study therefore, adopts the descriptive research approach under the quantitative research design to address the hypotheses of the study. The quantitative approach invalidates personal or qualitative judgement through a quantitative model in examining data. This study is positioned in the framework of positivist philosophy of reality. Positivists argue that only observable facts of validity or soundness, reliability (trustworthy), objectivity (impartially), precision (accuracy) and generalization can explain quantitative scientific investigation planned to define, predict and verify experimental associations in a fairly controlled environment (Wooldridge, 2011). Positivist believes that real events can be examined empirically and explained logically. Besides, positivist philosophy indicates that knowledge is externally objective and investigators should take firmly impartial and separate positions towards the phenomenon being examined. They asserted that such attitude would ensure that the values and biases of the researcher would not

influence the study and hence, threaten its validity (Eberhardt & Teal, 2011). This study therefore, follows the same traditions.

The study employed six composite and incomposite institutional factors obtained from World Governance Indicators. The composite institutional factors were created employing Principal Component Analysis (PCA) method. The six institutional factors, the study employed to create composite institutions include: rule of law, political stability, voice and accountability, control of corruption and absence of terrorism, regulatory quality and governance effectiveness. Asongu et al. (2017) indicated that principal component analysis reduces a set of strongly correlated indices of variables into an uncorrelated index. Tchamyou (2017) specifies that Principal Components account for information in the original data set. Thus, the information does not depart from the original after the analysis. This simply means that when PCA is employed, the intended objective would be achieved. In the PCA, it is required that only common factors that have an eigenvalue bigger than one or the mean should be retained (Kaiser, 1974; Jolliffe, 2002).

Model Specification

Following Udomkerdmongkol and Morrissey (2008) and Ngo (2017), we specify the domestic private and public investment functions as:

Objective 1: Effects of Institutions on Domestic Private Investment

$$\begin{aligned} DPriI_{it} = & \beta_0 + \beta_1 INS_{it} + \beta_2 DpuI_{it} + \beta_3 GDP_{it} + \beta_4 DCPS_{it} + \beta_5 EXTDEBT_{it} + \beta_6 FDI_{it} + \\ & \beta_7 INFLA_{it} + \beta_8 TRADE_{it} + \beta_9 DEBTSERV_{it} + \epsilon_{it} \end{aligned} \quad (4)$$

Objective 2: Effects of Institutions on Domestic Public Investment

$$\text{DPuI}_{it} = \beta_0 + \beta_1 \text{INS}_{it} + \beta_2 \text{DpriI}_{it} + \beta_3 \text{GDP}_{it} + \beta_4 \text{DCPS}_{it} + \beta_5 \text{EXTDEBT}_{it} + \beta_6 \text{FDI}_{it} + \beta_7 \text{INFLA}_{it} + \beta_8 \text{TRADE}_{it} + \beta_9 \text{DEBTSERV}_{it} + \phi_{it} \quad (5)$$

Objective 3: Moderating Effect of Institutions and FDI on Domestic Private investment

$$\text{DPriI}_{it} = \beta_0 + \beta_1 \text{INS}_{it} + \beta_2 \text{FDI}_{it} + \beta_3 \text{DpuI}_{it} + \beta_4 \text{GDP}_{it} + \beta_5 \text{DCPS}_{it} + \beta_6 \text{EXTDEBT}_{it} + \beta_7 \text{INS*FDI}_{it} + \beta_8 \text{INFLA}_{it} + \beta_9 \text{TRADE}_{it} + \beta_{10} \text{DEBTSERV}_{it} + \mu_{it} \quad (6)$$

Where: DPriI = Domestic Private Investment, DPuI = Domestic Public

Investment, GDP = Gross Domestic Product, FDI= Foreign Direct Investment, DCPS = Domestic Credit to Private sector, EXTDEBT = Total External Debt, INFLA = Inflation, TRADE = Trade, DEBTSERV= Debt service, INS*FDI_{it} = Interaction between Institutions and Foreign Direct Investment and ϵ_{it} , ϕ_{it} and μ_{it} = white noise or disturbance terms are expected to be independently distributed across countries with zero means. The variables use for N countries are specified by i , the observation in time T period is indexed by t . β s = the parameters to be determined.

The institutional variables (INS_{it}) is the vector of the institutional indicators which have the potential of affecting domestic investment in SSA. Six institutional indicators that are included individually in each model (due to multicollinearity among these indicators) are Regulatory Quality (RQ), Rule of Law (RL), Control of Corruption (CC), Voice and Accountability (VA), Government Effectiveness (GE), Political Stability and Absence of Violence/Terrorism (PS).

Justification and Measurement of Variables

Domestic public investment

Domestic public investment consists of both key infrastructure and non-infrastructure in an economy. It can displace or crowd-in domestic private investment. Domestic public investment serves as a catalyst to crowd in domestic private investment via provision of important infrastructure which acts as a complement to it. However, if the domestic public investment is in the form of non-infrastructure, it might crowd-out domestic private investment. Therefore, expectation of coefficient of domestic public investment in this study is ambiguous and will be determined in the model. Domestic public investment variable was obtained as (Domestic Investment minus Domestic Private Investment) as the proportion of GDP based on the literature reviewed. Simply because, it was derived from domestic investment labelled Gross Fixed Capital Formation, (private sector), proportion of gross domestic product.

Domestic Private Investment

Domestic private investment comprises of investment made by the private sector (together with private non-profit agencies) together with its fixed domestic assets. According to the literature, domestic private investment is the engine of growth of a nation's economy. Therefore, the expected sign of domestic private investment with regard to this study is positive coefficient. Furthermore, this indicator is sourced from WDI and labelled Gross Fixed Capital Formation, (private sector) proportion of gross domestic product.

Gross Domestic Product

GDP is one of the main variables employed to examine health of a nation's economy. It denotes the total value of the overall final goods and services produced over a certain time period. The growth of GDP provides a hint about the investment opportunities available to the economy. If the country's economy shows an increase in the real growth, it indicates possible increase in profits which will intend encourage investors to invest more. There is universal agreement among economists that a nation's growth of GDP would produce a positive effect on domestic private investment. This indicator was logged to avoid skewness into a normalised variable for credible result. Thus, modeling a variable with non-linear relationship, has the chances of producing errors which may skewed negatively. The GDP variable is captured as GDP growth (annual percentage). The a-prior expectation of this variable is positive and is obtained from WDI.

Domestic Credit to the Private Sector

Domestic credit to the private sector (DCPS) given by commercial banks for domestic private investment not for consumption purposes. DCPS also means financial resources given to the private sector by financial establishments, in the form of loans, acquisitions of non-equity securities, and trade credits and other accounts receivable, that create a claim for settlement or repayment. The empirical literature specifies that the flow of credit benefits the private sector by making funds available to finance business activities. The variable is captured as domestic credit given by financial sector and sourced from WDI. Therefore, the expected sign DCPS for this study is positive coefficient.

Foreign Direct Investment

FDI is net inflows of investment to gain a permanent management interest of (10% or more of voting stock) in a firm or company working in a country other than that of the entrepreneur or investor. On the other hand, it is the form of regulating or controlling the ownership of a corporate in one country by an individual or firms in another nation. It comprises reinvestment of earnings, equity capital, other long-term capital, and short-term capital. As disclosed in the literature reviewed, FDI has the potential of crowding-in or displacing domestic private investment. If FDI is in the form of high technology, energy and communication networks, it would crowd in domestic private investment. However, if FDI is in the form of existing investment in the country; it would crowd out domestic investment. This implies that FDI has come to compete with the existing firms or companies which do not have a good financial standing. It is captured as FDI Net inflows, proportion of gross domestic product and obtained from WDI. The coefficient of FDI could be positive or negative.

Total External Debt

Total external debt is a debt owed to foreign financial institutions or nonresidents serviceable in currencies, goods, or services. Total external debt is made up of public, publicly guaranteed, and private non-guaranteed long-term debt, use of IMF credit, and short-term debt. This normally happens when the debt service necessitates that all the internally generated revenue be used in the repayment of the debt and interest. It is captured external debt stocks percentage of Gross National Income (GNI) and was obtained from WDI. The expected sign of

external debt in this study is negative. Besides, this variable was logged to avoid skewness into a normalised variable for credible result. According to Kaufmann et al. (2010), the World Bank's governance or institutional indicators measure the following indicators and are all sourced from WGI.

Control of Corruption

Control of Corruption (CC) measures the degree to which public power is used for individual or private benefit, be it petty and large forms of corruption, perpetrated by state officials and private interests. If corruption is controlled in a country, it will attract foreign and domestic investors to invest in that domestic economy. So, if there is less corruption cases, it would produce positive impact on domestic investment. Thus, the absence of corruption, would generate a business-enabling environment for the economies of SSA. This is so because, there will be less bureaucracy regarding the procedures of business registration and documentations. The a priori expectation of the coefficient of CC for this study is positive.

Government Effectiveness

Government Effectiveness (GE) focuses on inputs needed to formulate and implement good policies. This indicator has to do with the quality of the bureaucracy and how government is dedicated to implementing the formulated policies which provide congenial business environment for domestic private investment to flourish. In the nutshell, it measures superiority of policy creation and execution, and dependability of government's assurance to the formulated

policies. Besides, the quality of public and civil services and its individuality from political pressures is of paramount importance. If GE is high in a country, it would produce positive impact on domestic private investment. This is so because, the investors will be optimistic that government will stick to its promise and hence, upsurging the investor confidence. Again, with an improvement in GE, domestic public investment will also increase. This is so because, both public and civil services will be up to their task. The expected sign of GE is positive.

Political Stability and Absence of Violence/Terrorism

Political stability and absence of terrorism (PS) measures discernments of the probability that government in power may be toppled by possibly undemocratic and/or forceful mediums, together with domestic violence or terrorism. Political instability may serve as a catalyst to prevent domestic private investment. This is because, the domestic investors will be afraid to invest in the economy, knowing very well that their investment is at the mercy of the market unfriendly government in power. However, a country which is a political haven will cause domestic private investment to increase. The a priori expectation of PS in this study is positive.

Regulatory Quality

Regulatory quality (RQ) also measures the capability of government to formulate and implement comprehensive or good policies, rules and regulations, decision as well as procedures which allow and inspire private sector development. It considers the market-friendly policies such as foreign trade and business expansion in the domestic economy. High regulatory quality presence in a country

will cause the domestic private investment to upsurge. Thus, regulatory superiority in a nation may serve as an engine to enhance domestic investment. Furthermore, when the domestic investors know that private sector is investment friendly, they will increase their investment. The a- prior expected sign of RQ is positive.

Rule of Law

Rule of Law (RL) measures how agents have self-confidence and obey the rules of society, particularly degree to which property rights are safeguarded. These also comprise quality of contracts enforceability, fairness of police involvement, the effectiveness and predictability of the judiciary system (courts); also, low rate of crime and violence. When this institution is working perfectly, it serves as a conduit for domestic investment to thrive. This will also increase the confidence of the domestic investors on the notion that, their investment will be protected. The expected a priori sign of this indicator is positive.

Voice and Accountability

Voice and Accountability (VA) captures degree to which citizens of a nation are able to contribute in the selection of their leaders or governments. This includes freedom of expression and association and independence of media. Besides, free media plays very important function of monitoring government officials by holding them answerable for their actions. In an economy where this phenomenon exists, both foreign and domestic investors find it safe to invest. This indicator simply means that, citizens have the right to criticise government constructively on the issues which may not inured to their benefits. Thus, citizens become watch dogs of

the government for proper service delivery. Hence, government officials also become answerable for some of the decisions taken which may not be in the good interest of the nation. In this sense, VA will cause the domestic investment to increase. The expected sign for this indicator is positive.

Inflation

Inflation is measured by the annual growth rate of the gross domestic product implicit deflator which displays the rate of price change in the country. The GDP implicit deflator is the ratio of gross domestic product in current local currency to GDP in constant local currency. Furthermore, consumer price index (CPI) is also another most well-known indicator for measuring inflation. The CPI measures the proportionate change in the prices of a basket of goods and services consumed by households. An increase in an inflation or CPI will produce an adverse effect on the domestic investment. This means inflation has the potential to reduce domestic investment. Thus, price upsurges will affect the purchasing power of the consumers from buying more. This may also affect domestic private investment negatively. The expected a priori sign is negative. This indicator is sourced from WDI.

Trade

Trade is measured as the addition of exports and imports of goods and services as a proportion of gross domestic product. If a nation sells more products than it purchases, it has a favourable balance also known as trade surplus. However, if the country purchases more than it sell, it has an unfavourable balance or a trade

deficit. Trade may have positive impact on the domestic private investment. This happens when firms and individuals are able to produce and sell more products to obtain the needed profits for reinvestment or ploughing back the profits into their businesses. This variable is sourced from the World Development Indicators. The a priori expected sign is positive.

Debt Service

Public and publicly guaranteed debt service is made up of the principal repayments and interest truly paid in currency, goods, or services on long-term obligations of public debtors and long-term private obligations guaranteed by a public entity. Debt service may adversely affect domestic public investment. This happens when government use all the revenue generated for both principal and interest payment of the money borrowed. This therefore, prevent the government from embarking upon massive domestic public investment or infrastructures. This indicator was logged to avoid skewness into a normalised variable for credible result. Thus, modeling a variable with non-linear relationship, has the chances of producing errors which may skewed negatively. Data are in current U.S. dollars. Debt service is sourced from the World Development Indicators. The a priori expectation is negative.

Table 1: Variables and their expected signs

Variable	Short Name	Source	Expected Sign
Domestic Investment	DomI	WDI	+/-
Domestic private Investment	DPriI	WDI	+
Domestic Public Investment	DPuI	WDI	+/-
Political Stability & absence of violence/terrorism	PS	WGI	+
Government Effectiveness	GE	WGI	+
Regulatory Quality	RQ	WGI	+
Rule of Law	RL	WGI	+
Voice and Accountability	VA	WGI	+
Control of Corruption	CC	WGI	+
Trade	Trade	WDI	+
Gross Domestic Product	GDP	WDI	+
Domestic credit to the private sector	DCPS	WDI	+
Debt service	DETSERV	WDI	-
Total External debt	EXTDEBT	WDI	+/-
Foreign Direct Investment	FDI	WDI	+/-
Inflation	INFLA	WDI	-

Source: Galah (2020)

Data Description and Sources

In this study, Domestic Private Investment, Domestic Public Investment, FDI, Domestic Credit to Private sector, Trade and Inflation are measured as percentage of GDP. The institutional variables were captured as estimated scores ranging from -2.5 to 2.5. According to Kaufmann et al, (2010) and World Bank, (1992), the assessment of the performance of Institutional Indicators ranges approximately from -2.5 (as weak performance) to 2.5 (as robust performance). The larger the value of the score or an index, then it implies an improvement in the quality of the nations' institutions. Thus, -2.5 indicates poorest quality of an institution while 2.5 signifies maximum quality of an institution. This means that

any institutional indicator which has negative coefficient, depicts weak institution which may not promote an upsurge in domestic investment. However, positive coefficient implies good institution which will enhance the progress of the domestic investment.

The sample size for the study was 336 observations covering a period of 2006 to 2017. Twenty-eight Sub-Saharan Africa nations are used in this study within 12-year period. The choice of the sample size of 336 observations was influenced by the availability of data points on each indicator or variable. Besides, as a result of missing values for some of the indicators in some years, the researcher has to depend only upon the periods for which data were available for all the variables under examination. The panel data is robustly balanced with 336 observations.

This study used multiple secondary data sources from World Governance Indicators (WGI), Africa Development Indicators (ADI) and World Development Indicators (WDI). The multiple choice of data sources is necessitated by lack of one shop source for data on all the variables of interest needed for this study. Hence, the study has to depend on multiple sources of data in order to meet reasonable sample size that will enable us to accomplish the motives or objectives of the study. This study applied annualised panel data series on all the variables.

Estimation Technique

This study focuses on static panel analysis by using fixed effects (FE) and random effects (RE) techniques to estimate models specified above. The estimation of the panel data is grounded on the premise that the "heterogeneity" of cross-

sectional unit is taken into consideration in the estimation technique. Some authors such as (Baltagi, 1985; Cai et al., 2008; El-Osta and Mishra, 2005; Kaltsas, Bosch and McGuirk, 2008), in their previous works, the most common models they made use of in panel data are fixed and random effects models. These models are founded on the theory that variances between cross-sectional units could be captured using an intercept (constant) term precise to each cross-sectional unit. This precise term of the intercept is measured to be a random disturbance in the random effect model and a fixed parameter in the FE model.

Fixed effect model

The study ran the FE model, which permits heterogeneity or independence in SSA nations by letting each country to obtain its individual intercept (constant) value. With this technique, FE change via time, while the individual nation FE change across each country. Furthermore, even though the countries may have same economic conditions, they may have different natural resource endowment, external donations, aid, grants international trade relationship etc. which can influence terms of trade and hence, in turn affect their GDP. The fixed effect model is expressed as:

$$Y_{it} = (\beta_0 + \alpha_i) + X'_{it}\beta + v_{it} \quad (7)$$

Where: β_0 = constant term, α_i = a fixed effect specific to the separate countries or the time period that is not involved in the regression, v_{it} = the error terms.

The errors are independent and equally distributed with zero mean and constant variance, $v_{it} \sim IID (0, \delta^2 v)$. Y_{it} and $X'_{it}\beta$ are dependent and independent

variables, respectively. The FE model controls all the time-invariant variances between individuals so that the estimated coefficients of the FE models cannot be biased as a result of omitted time-invariant features such as culture, religion, gender, race, etc. It was specified that any variations within the regressand must be result of effects other than the fixed characteristics if the unnoticed variable do not vary over time. Some authors raised concern about the fixed effect model that, it consumes a high degree of freedom and hence could be employed to study time-invariant causes of the dependent indicators.

A significant hypothesis of the FE model is that time-invariant characteristics are specific to the individual and should not associate with other individual characteristics. If error terms are associated, the fixed effect not suitable. It is presumed that individual fixed effects (dummy variables) are not related with the other regressors, Baltagi (2008). The panel data solution to the problem of correlated effects is to eliminate them by using a suitable transformation. The within transformation and the first difference transformation are the two methods of transforming the data to eliminate the correlated effects. The first difference is made by differencing the equation with the lagged values of the indicators for each group or entity. The within transformation is done by differencing the equation with the average of each variable for each entity. Therefore, those dummy indicators that control countries' differences are omitted. This elimination does not cause any partiality in the regressors or explanatory variable coefficient.

Estimating the fixed effect model

There are several methods that can be used in assessing the fixed effect model. These are First Differenced (FD) estimator, the Least Square Dummy Variable (LSDV) and the Within Estimators. The LSDV uses dummy variables, while the “within” estimation do not use dummy indicators or variables. These methods provide equal parameter estimates of independent variables. The “between” estimation fits a model using individual or time means of dependent and independent variables without dummies.

The LSDV generally is used because it is comparatively easier to estimate and interpret. Though, it becomes difficult when there are several individuals or groups in panel data. If T is fixed and $n \rightarrow \infty$ (where, n = the number of observations and T = the number of time periods), the parameter estimates of the independent variables are constant but the coefficients of individual impacts, $\beta_0 + \alpha_i$, are not (Baltagi, 2008).

“Within” estimation do not require dummy indicators or variables, but it utilises deviations from group average value (mean). Thus, “within” estimation utilises difference in every individual or entity in its place of a huge number of dummies. The “within” estimation is shown in equation (6) below as;

$$(y_{it} - \bar{y}_i) = (x_{it} - \bar{x}_i)' \beta + (\varepsilon_{it} - \bar{\varepsilon}_i) \quad (8)$$

Where: \bar{y}_i = mean of dependent variable (DV) of the individual (group), \bar{x}_i = the means of the independent variables (INDVs) and $\bar{\varepsilon}_i$ = the mean of errors of the group.

Furthermore, with the “within” estimation or assessment, the incidental parameter problem is no longer an issue. The parameter assessment of independent variables in the “within” estimation are equivalent to those of LSDV. The “within” assessment reports the exact sum of squared errors (SSE). The “within” estimation, nevertheless, has many shortcomings. Firstly, data alteration or transformation for the “within” estimation do away with all the time-invariant variables (ethnic group, gender & race) that do not change within the entity Kennedy, (2008). Also, the “within” estimation gives incorrect statistics.

Finally, the R^2 of “within” assessment is not accurate in the sense that, the intercept (constant) term is repressed. The “between groups” estimation utilises differences between individual groups. Precisely, this estimation computes group means of the dependent variables and the independent variables and hence, decreases the quantity of observations. The between estimation, therefore, is stated in the equation below as;

$$\bar{y}_i = \alpha_i + \bar{x}_i + \bar{\varepsilon}_i \quad (9)$$

Where: \bar{y}_i = mean of dependent variable, \bar{x}_i = means of independent variables and $\bar{\varepsilon}_i$ = mean of errors of the group.

Consequently, the empirical fixed effects models constructed are shown in the equation below as;

$$\begin{aligned} DPriI_{it} = & (\beta_0 + \alpha_i) + \beta_1 INS_{it} + \beta_2 DpuI_{it} + \beta_3 GDP_{it} + \beta_4 DCPS_{it} + \beta_5 EXTDEBT_{it} + \\ & \beta_6 FDI_{it} + \beta_7 INFLA_{it} + \beta_8 TRADE_{it} + \beta_9 DEBTSERV_{it} + \varepsilon_{it} \end{aligned} \quad (10)$$

$$\begin{aligned} \text{DPuI}_{it} = & (\beta_0 + \alpha_i) + \beta_1 \text{INS}_{it} + \beta_2 \text{DpriI}_{it} + \beta_3 \text{GDP}_{it} + \beta_4 \text{DCPS}_{it} + \beta_5 \text{EXTDEBT}_{it} + \\ & \beta_6 \text{FDI}_{it} + \beta_7 \text{INFLA}_{it} + \beta_8 \text{TRADE}_{it} + \beta_9 \text{DEBTSERV}_{it} + \boldsymbol{\phi}_{it} \end{aligned} \quad (11)$$

$$\begin{aligned} \text{DPriI}_{it} = & (\beta_0 + \alpha_i) + \beta_1 \text{INS}_{it} + \beta_2 \text{FDI}_{it} + \beta_3 \text{DpuI}_{it} + \beta_4 \text{GDP}_{it} + \beta_5 \text{DCPS}_{it} \\ & + \beta_6 \text{EXTDEBT}_{it} + \beta_7 \text{INS} * \text{FDI}_{it} + \beta_8 \text{INFLA}_{it} + \beta_9 \text{TRADE}_{it} + \beta_{10} \text{DEBTSERV}_{it} + \boldsymbol{\mu}_i \end{aligned} \quad (12)$$

Random effect model

This study also implored random effect (RE) model to check if each country's intercept (constant) value is the same as the FE model constant value. Here all the nations have mutual (common) average value for the intercept. The random effect model helps in regulating for unobserved (unnoticed) heterogeneity when the heterogeneity does not change over time and not associated with the independent variables. The assumption of random effect model is that each country's unnoticed heterogeneity does not correlate with the independent variables. That is RE model assumes individual specific effect or difference across entities is unassociated or not related with the explanatory or illustrative variables.

$$Y_{it} = \beta_0 + X'_{it}\beta + (\alpha_i + v_{it}) \quad (13)$$

Where: β_0 = the constant term, α_i = RE specific to an individual entity (groups) or the time period that is not put into the regression, v_{it} = the error terms and the errors are independent and identically distributed with zero mean and constant variance, $v_{it} \sim i.i.d (0, \delta^2 v)$.

It is expected that in the RE model the α_i is independently distributed of X_{it} . The vital difference between fixed and random effects is whether the unnoticed

individual consequence includes elements associated with the model's independent variables, rather than these influences or impacts are stochastic or not. The merit of RE model over fixed effect model is that, one can include time-invariant indicators such as gender, where the intercept absorbs all time-invariant indicators. The error term of the individual is uncorrelated with the independent variables, that allow invariant time variables to perform a function as regressors. Fixed effects model removes from the estimate the time-invariant effects. RE and FE estimators are models that handle longitudinal or panel data specific structures. Thus, unobservable individual heterogeneity is taken into consideration by the two models.

Estimating random effect model

In the composite (merged) error term of a one-way random effect model, α_i is presumed independent of the traditional error term v_{it} and the independent variables. This supposition (assumption) is not needed for a FE model. The random effect model is specified below in equation 12 as;

$$y_{it} = \beta_0 + X'_{it} \beta + (\alpha_i + v_{it}) \quad (14)$$

Where, $\alpha_i \sim IID(0, \sigma^2\alpha)$ and $v_{it} \sim IID(0, \sigma^2v)$.

The covariance elements of $Cov(\epsilon_{it}, \epsilon_{js}) = E(\epsilon_{it}, \epsilon'_{js})$ are $\sigma\alpha^2 + \sigma v^2$ if $i = j$ and $t = s$, and $\sigma\alpha^2$ if $i = j$ and $t \neq s$. Hence, the covariance structure of the composite errors is $\Sigma = E(\epsilon_i \epsilon'_i)$ for individual i and the variance-covariance matrix of the whole disturbances or errors (V) are shown below:

$$\Sigma = \begin{bmatrix} \sigma\alpha^2 + \sigma v^2 & \sigma\alpha^2 & \dots & \sigma\alpha^2 \\ \sigma\alpha^2 & \sigma\alpha^2 + \sigma v^2 & \dots & \sigma\alpha^2 \\ \vdots & \vdots & \ddots & \vdots \\ \sigma\alpha^2 & \sigma\alpha^2 & \dots & \sigma\alpha^2 + \sigma v^2 \end{bmatrix} \quad \text{And} \quad V = I_n \otimes \Sigma =$$

$$\begin{bmatrix} \Sigma & 0 & \dots & 0 \\ 0 & \Sigma & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & \Sigma \end{bmatrix}$$

A RE model is assessed by the GLS when the covariance structure is identified, and by FGLS when the covariance structure of the composite error is unidentified.

The empirical random effect models are specified in the equations below as;

$$\text{DPriI}_{it} = \beta_0 + \beta_1 \text{INS}_{it} + \beta_2 \text{DpuI}_{it} + \beta_3 \text{GDP}_{it} + \beta_4 \text{DCPS}_{it} + \beta_5 \text{EXTDEBT}_{it} + \beta_6 \text{FDI}_{it} + \beta_7 \text{INFLA}_{it} + \beta_8 \text{TRADE}_{it} + \beta_9 \text{DEBTSERV}_{it} + (\alpha i + \epsilon_{it}) \quad (15)$$

$$\text{DPuI}_{it} = \beta_0 + \beta_1 \text{INS}_{it} + \beta_2 \text{DpriI}_{it} + \beta_3 \text{GDP}_{it} + \beta_4 \text{DCPS}_{it} + \beta_5 \text{EXTDEBT}_{it} + \beta_6 \text{FDI}_{it} + \beta_7 \text{INFLA}_{it} + \beta_8 \text{TRADE}_{it} + \beta_9 \text{DEBTSERV}_{it} + (\alpha i + \phi_{it}) \quad (16)$$

$$\text{DPriI}_{it} = \beta_0 + \beta_1 \text{INS}_{it} + \beta_2 \text{FDI}_{it} + \beta_3 \text{DpuI}_{it} + \beta_4 \text{GDP}_{it} + \beta_5 \text{DCPS}_{it} + \beta_6 \text{EXTDEBT}_{it} + \beta_7 \text{INS} * \text{FDI}_{it} + \beta_8 \text{INFLA}_{it} + \beta_9 \text{TRADE}_{it} + \beta_{10} \text{DEBTSERV}_{it} + (\alpha i + \mu_{it}) \quad (17)$$

Post Estimation Techniques

Hausman test

Hausman post estimation test was performed to ascertain the robustness and consistency of estimates from regressions as to which of the models, either FE or RE model was fitting to accept. The Null Hypothesis (H_0) for Hausman test: “Random effect Model is appropriate”. While the Alternative Hypothesis (H_1) also: “Fixed effect Model is appropriate”. According to Hausman test, rule of thumb is that if p-value is significant, then discard Null Hypothesis. Otherwise, do not reject Alternative Hypothesis. Thus, if the p-value is bigger than 0.05 ($p > 0.05$), then

accept the null hypothesis. Otherwise, discard the null hypothesis when the p-value is less than 0.05 ($p < 0.05$). The Hausman specification test relates models of FE and RE under the null hypothesis that the individual impacts are unrelated to any model independent variables (Hausmann, 1978). The test statistic follows the distribution of the chi squared with k degrees of freedom.

$$LM = (b_{fixed} - b_{random})' \hat{W}^{-1} (b_{fixed} - b_{random}) \sim \chi^2(k) \quad (18)$$

$$= Var [b_{fixed} - b_{random}] = Var (b_{fixed}) - Var (b_{random}) \quad (19)$$

The formula of the Hausman test investigates whether "the estimate of random effects is not significantly different from the unbiased estimate of fixed effects" (Kennedy, 2008). \hat{W} is the variance in the assessed covariance matrices of the estimates of fixed and random effects. When individual influences are related with other independent variable, then, random effect model violates the Gauss-Markov assumption and is therefore, no longer the Best Linear Unbiased Estimate (BLUE). This implies that the individual influences are part of the error term in the RE model. Consequently, if the null hypothesis is discarded, then FE model is considered over its random complement. In a fixed effects model, the individual impacts are part of the intercept and the association between the intercept and regress do not violate any of the Gauss Markov assumption; a FE model is still BLUE.

Serial correlation test

The study employed Pesaran Cross-Sectional Dependence Test to examine whether the residual was associated across the countries or not. Here, the Null Hypothesis (H_0): "There is no serial correlation" and the Alternative Hypothesis (H_1): "There is serial correlation". Besides, if the test fails to discard the null

hypothesis that p-value is greater 0.05 ($p > 0.05$), then residuals do not correlate across the countries. Thus, if p value is bigger than 0.05 then, it implies there is no serial correlation. Otherwise, there is serial correlation.

Endogeneity occurs when there is an association among any of the regressors (X_{it}) and the stochastic error term (u_{it}), that is $\text{Cov}(X_{it}, u_{it}) \neq 0$. This condition may occur as a result of the omission of relevant time varying factors, simultaneous equations, and measurement errors. The presence of endogeneity causes the usual OLS estimates to be biased. The Pesaran CD test performed in this study indicated that there is no serial between the regressors and the stochastic error term. The results of Pesaran CD tests were indicated in the regression results used for the analysis in thesis.

Chapter Summary

The chapter explains in detail the methodology used to analyse the data required for this study. A detailed description of the outline used to estimate domestic investment (domestic private investment and domestic public investment) were presented. These include research design, model specification or empirical models involving all the variables (dependent and independent as well as the control variables were specified); variables description and measurement followed by the data sources and sample size. Fixed and Random effects estimation techniques were discussed. FE estimates are computed from changes within each country across time, whilst the RE estimates are used to explain both variations over time and also changes among countries. Besides, post estimation test of

Hausman specification was discussed as to aid in selecting the suitable estimation techniques between RE and FE models.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the findings and analysis of the study with regards to the objectives of examining the effects of institutional indicators on domestic investment in Sub-Sahara African countries. It first presents the descriptive (summary) statistics of the study, correlation matrix and then, the empirical results.

Descriptive Statistics

This section deals with descriptive statistics of all the indicators (i.e., dependent and independent as well as the controls) used in the study to examine the effects of institutional variables on domestic investment. It also shows the central tendency (average value) and degree of the changeability of the variables. The average values specify values of the mean of the indicators employed in the whole model. The standard deviation captures the distribution of data around the average value. The standard deviation also specifies how near the data is to the mean value. The highest and smallest values measure the spread of the data. The larger the range of values, the higher the variability in a variable and the lower the range of values, the lower the level of variability in the variable. The values of the mean, maximum, minimum and standard deviation of the variables are shown below.

Table 2: Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
VA	336	-0.52141	0.672908	-1.83945	0.940896
PS	336	-0.55042	0.809041	-2.66528	1.104041
RL	336	-0.6809	0.591873	-1.68982	0.996262
CC	336	-0.70775	0.558558	-1.56283	1.039068
GE	336	-0.80808	0.620904	-1.77554	1.056994
RQ	336	-0.63237	0.570964	-1.58618	1.12727
INS	336	1.39E-09	1.000002	-1.70462	2.833654
GDP	336	4.515494	3.638388	-20.59877	20.71577
DCPS	336	28.04541	109.0211	2.083265	1948.587
FDI	336	5.311827	10.62318	-6.05721	103.3374
DPriI	336	16.00806	7.629883	1.455396	50.00016
DPuI	336	6.669322	3.957838	-8.21639	31.2714
EXDEBT	336	21.86225	1.401332	18.68736	25.91898
INFLA	336	7.056021	9.837519	-29.6911	80.75458
TRADE	336	73.87638	33.64359	19.1008	311.3541
DEBTSERV	336	18.3321	1.802068	10.79048	22.78444

Source: Galah (2020)

Taking a cursory look at the summary statistic in the table 2 above, the panel data is robustly balanced with 336 observations. The average values of all the institutional indicators are negative. From the period 2006-2017, the Voice and Accountability Index average value is approximately -0.521 with a smallest value of -1.839 and a maximum of 0.941. The average value of -0.521 can be interpreted that SSA countries have weak Voice and Accountability (VA). This implies that in SSA countries, their citizens find it difficult to contribute in the choice of their governments. This may also include lack of freedom of expression, association and independence of the media. Voice and Accountability deviates about the mean

approximately by 0.67. Besides, the average value of political stability (PS) is about -0.55 with a least value of -2.67 and a maximum value of 1.104. The average value of -0.55 indicates that there is political instability and presence of terrorism in Sub-Saharan African nations. PS deviates from the mean approximately by 0.81. Again, the average value of Rule of Law is approximately -0.68 and it deviates 0.59 from the mean. The mean value of -0.68 illustrates weak rule of law in the SSA countries. This therefore, implies that there is lack of quality of contracts enforceability, unfairness of the police involvement, and the ineffectiveness and unpredictability of the judiciary system; and possibility of crime and violence in SSA countries.

The next institutional variable to consider is the control of corruption (CC). The average value of CC is approximately -0.708 and it deviates by 0.56 from the mean. The mean value of -0.708 of CC shows that there are high cases of corruption in SSA countries. This means that, most of the public officials in the SSA countries utilise public power for their self-interest, including petty and grand forms of corruption. The highest corruption index recorded is 1.039 and the minimum is -1.56. Government Effectiveness (GE) is another institutional variable to consider. The average value of GE is approximately -0.808 and it deviates 0.621 from the mean. The mean value of -0.808 of GE implies that there is lack of quality of bureaucracy and how governments in SSA countries are committed to implementing the formulated policies which will provide congenial business environment for domestic private investment to thrive. This also means that there is lack of good public and civil services and their individuality or independence

from political pressures. The smallest and highest values of the GE are -1.78 and 1.057 separately.

The last institutional variable to consider is Regulatory Quality (RQ). Its average value is -0.632 and it deviates 0.571 from the mean. The mean value of -0.632 implies that governments of SSA countries are not able to formulate and implement comprehensive policies and rules (regulations) which allow and encourage private sector development. The mean value could also imply that, governments of SSA countries may formulate good policies but fail to implement them to enable private sector development. Besides, the average value of -0.632 implies that there are market unfriendly policies which will affect foreign trade and business growth in the Sub-Saharan African states. Again, the mean value of the composite index of the six institutional variables created using principal component analysis (PCA) is approximately 1.4 and it deviates approximately 1 (one) about the mean with maximum value of 2.834 and a minimum of -1.705.

Furthermore, the average value of GDP growth of SSA countries used in this study is about 5 percent. The highest GDP growth is approximately 20.7 percent and lowest is -20.5 percent and it varies about 3.6 from the mean. Besides, the average value of domestic credit to the private sector is approximately 28.045 percent with the largest value of 1948.59 and smallest value of 2.083. It however, deviates 109.02 from the mean. The FDI has an average value of 5.312 with the extreme value of 103.34 and a lowest value being -6.057. It however, deviates from the mean by approximately 10.62.

The average value of the Domestic Private Investment (DPriI) of SSA countries is approximately 16 percent with the highest value of 50 percent and smallest value being 1.46 percent. Nevertheless, the variation in the domestic private investment as a proportion of the GDP within SSA countries is roughly 8 percent about the mean. The mean value of domestic public investment is 6.67 percent which is a proportion of the GDP with the highest value of 31.27 percent and minimum value being -8.22 percent. The variation in the domestic public investment is 3.96. Another variable to consider is the external debt which records an average value of approximately 22 with a minimum value of roughly 19 and a maximum of nearly 25.9. It however, deviates approximately 1.40 from the mean. Inflation has an average value of 7.056 with the highest value of 80.75 and the lowest value of -29.69. Nonetheless, it deviates 9.84 from the mean. Trade recorded an average value of 73.88 percent. It varies 33.64 percent with the highest value of 311.35 percent. and the smallest as 19.10. Finally, debt service obtained an average value of 18.33 with the maximum and minimum values of 22.78 and 10.79 respectively. It however, deviates 1.80 from the mean value. The next discussion will be on the correlation matrix.

Univariate Analysis: Pairwise Correlation Test

The correlation matrix aids us understand the degrees of substitution of associations among the variables in the model which are particularly important in order to avoid the problems of multicollinearity and biased estimates.

A possible degree of multicollinearity among the regressors was tested by constructing a correlation matrix of the indicators. This is also to find out the degree

of correlation between the dependent variables and its regressors. The correlation matrix has been presented in Appendix A. Appendix A, illustrates direct or positive correlation between domestic private investment and five institutional variables including aggregated institutional variable which are significant at 1% and 5% respectively. Voice and accountability (VA) and political stability (PS) are not significant. The correlation between domestic public investment and the institutional variables is both negative and positive. Only PS is significant at 5%. The values which are statistically significant, imply there is a vital negative and or positive association between the regressand and institutional indicators. FDI, Trade, External debt and GDP positively correlate with domestic private investment (DPriI). Inflation and domestic credit to the private sector are negatively correlated with DPriI. Moreover, GDP, external debt, debt service, and inflation correlate negatively with domestic public investment. Besides, Trade correlate positively with domestic public investment. The highest simple correlation between the variables was 0.943, which shows negative correlation between GE and regulatory quality. Control of corruption, institutional composite index and rule of law are significant at 5 percent while regulatory quality and government effectiveness are also significant at 1 percent and correlate positively with domestic private investment respectively. Voice and accountability and political stability have positive correlation but are not significant. It is recommended that a simple or modest association between independent variables should not be taken into account as harmful until they surpass 0.80 (Bryman and Cramer, 1997; Judge, Hill, Griffiths, Lutkepohl and Lee, 1982).

Institutions and Private Domestic Investment

This section presents the estimated results of effects of the institutions on private domestic investment. The estimations are based on separate models of each institutional variable with controlling variables in order to draw meaningful conclusions. Nevertheless, the nature of institutional variables is a constituent of index determining the quality of dissimilar characteristics of institutions. La Porta et al. (1999), indicate that, different measures of institutional quality are frequently associated among themselves. Daude and Stein (2007) specified that if there is meaningfully high relationship, it may prevent the degree to which the importance of each institutional measurement can be acknowledged or known. Globerman and Shapiro (2002) pointed out that, it is very problematic to combine all the six institutional variables in one regression model or equation with the notion that, the indices are extremely interrelated with one another. According to Giant (2017) there is mutual solution used by numerous academics to solve this problem. Thus, to include each institutional indicator or variable independently in different models with the aim of determining their coefficients, and to find out the specific effects and prescribe policy accordingly. Therefore, seven (7) models were estimated in turns under each objective of the study. Table 3 below presents the estimated models.

Table 3: Effect of institutions on private domestic investment

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
DPuI	-0.152* (0.0741)	-0.186* (0.0720)	-0.155* (0.0726)	-0.118 (0.0732)	-0.132 (0.0736)	-0.185* (0.0718)	-0.155* (0.0726)
DCPS	-0.0000920 (0.00208)	0.000236 (0.00201)	0.000241 (0.00205)	-0.000127 (0.00208)	0.000175 (0.00209)	0.000525 (0.00201)	0.000241 (0.00205)
FDI	0.114** (0.0261)	0.116*** (0.0255)	0.113*** (0.0257)	0.113*** (0.0260)	0.113*** (0.0262)	0.110*** (0.0254)	0.113*** (0.0257)
EXDEBT	0.726 (0.532)	1.198* (0.528)	0.809 (0.525)	0.987 (0.537)	0.757 (0.543)	0.795 (0.522)	0.809 (0.525)
GDP	2.325** (0.775)	3.673*** (0.906)	1.943* (0.758)	1.680* (0.782)	2.199** (0.774)	3.233*** (0.891)	1.943* (0.758)
DEBTSERV	-0.334 (0.321)	-0.402 (0.312)	-0.335 (0.316)	-0.237 (0.319)	-0.280 (0.321)	-0.263 (0.310)	-0.335 (0.316)
INFLA	-0.0453 (0.0258)	-0.0403 (0.0250)	-0.0454 (0.0254)	-0.0406 (0.0258)	-0.0439 (0.0259)	-0.0361 (0.0250)	-0.0454 (0.0254)
TRADE	0.0545*** (0.0129)	0.0579*** (0.0130)	0.0563*** (0.0128)	0.0548*** (0.0129)	0.0545*** (0.0130)	0.0620*** (0.0130)	0.0563*** (0.0128)
VA	1.989 (1.188)						
CC		8.577*** (1.554)					
RL			4.748*** (1.339)				
RQ				3.495* (1.375)			
PS					-0.0469 (0.663)		
GE						9.235*** (1.630)	
INST							2.810*** (0.792)
Const.	-49.72** (15.31)	-84.96*** (19.94)	-40.61** (15.10)	-41.40** (15.17)	-49.69** (15.50)	-67.49*** (19.47)	-43.84** (14.98)
N	336	336	336	336	336	336	336
Hausman(X^2)	4.82	16.11	13.56	2.51	2.41	17.42	13.56
Prob>chi2	0.8498	0.0409	0.1387	0.9807	0.9832	0.0261	0.1387
Pesaran CD test for serial correlation	0.179(Pr. = 0.8579)	0.550(Pr. = 0.5824)	0.240(Pr. = 0.8101)	-0.345(Pr. = 0.7298)	0.220(Pr. = 0.8262)	-0.053(Pr. = 0.9574)	0.240(Pr. = 0.8101)

DPuI =domestic private investment, DPuI = domestic public investment, DCPS = domestic credit to the private sector, FDI = foreign direct investment, EXDEBT = external debt, GDP = gross domestic product, INFLA = inflation, VA = voice and accountability, CC = control of corruption, RL= rule of law, RQ=regulatory quality, PS=political stability and absence of violence/ terrorism and INS = composite index of the institutional variables. Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$,

Source: Galah (2020).

Table 3 displays regression results of both fixed and random effects models for domestic private investment (dependent variable) and the seven institutional variables of interest with some control variables. Hausman test was executed to select the appropriate estimation techniques. The null hypothesis (H0): “Random effects model is appropriate” and the alternative (H1): “Fixed effects model is appropriate”. The test indicated that random effects selected models’ one, three, four, five and seven while fixed effect also selected models’ two and six. The probability chi-square for the five models selected by random effect, is bigger than 0.05 decision rule while that of fixed effect is less than 0.05. Accordingly, the analysis of the first objective was grounded on the regression results of both random and fixed effects models in table 3 above.

The serial correlation test was performed to ascertain whether there is endogeneity problem. Pesaran Cross-sectional Dependence test was done and the null hypothesis (H0): “There is no serial correlation” and alternative hypothesis (H1) “There is serial correlation”. The test indicated no serial correlation between the error term and the regressors. Thus, the null hypothesis was not rejected of no serial correlation with the probability value greater than 0.05 for all the seven models in table 4.2. Per the decision rule, the null hypothesis will be rejected if p value is lesser than 0.05 ($p < 0.05$).

The model one (1) in table 3 displays the results of voice and accountability (VA) as the variable of interest. The regression coefficient indicates that VA is insignificant even though it is positive. This result indicates that voice and accountability have no influence on the domestic private investment in Sub-

Saharan African countries.

Model two (2) shows that control of corruption (CC) has a positive influence on domestic private investment at 1 percent significance level. The positive association between CC and Domestic private investment means that a unit rise in CC, will cause domestic private investment to surge by 8.58 units. This means that an effective corruption control, would lead to an improvement in domestic private investment in SSA nations. Thus, the absence of corruption, would create a business-friendly environment for the economies of SSA countries. Nunnenkamp (2004) indicated that countries which have low corruption to a greater extent will impact positively on domestic private investment. Weder (1998) also revealed that nonexistence of huge corruption presence enhances domestic investment.

The model three (3) indicates that rule of law (RL) is statistically important at 1 percent significance level. The positive coefficient of 4.748 indicates a direct relationship between rule of law and domestic private investment. This implies that a unit improvement in rule of law, will raise the domestic private investment approximately by 4.75 units in SSA countries. The positive coefficient of rule of law meets a priori expectation of the study. The result suggests that if agents have self-confidence in and conform to the rules of society, particularly the degree to which property rights are safeguarded it will promote domestic private investment. The robustness of the rule of law would serve as a conduit for domestic private investment to flourish in SSA countries. This result also confirms that of Nunnenkamp (2004) which points out that, economies which have strong property

right protection, serves as a conduit for domestic private investment to upsurge. Li and Resnick (2003) also indicated in their studies that property right protection decreases risks and increases domestic private investment. Brunetti et al (1998) investigated correlation between private investment and institutional uncertainty and disclosed that nonexistence of rule of law is harmful for domestic investment.

Regulatory quality (RQ) produces positive and statistically important influence on the domestic private investment at 10 percent significance level with the coefficient of 3.495. This result signifies positive association between regulatory quality and domestic private investment. Thus, a unit improvement in the regulatory quality, will surge domestic private investment approximately by 3.5 units. This result implies that if governments in SSA countries formulate and implement comprehensive policies and rules which may permits and encourage growth of the private sector, it will cause an increase in domestic private investment. Percoco (2014) indicated in his work on quality of institutions and private participation in transport infrastructure investment: Evidence from developing countries. and concluded that greater participation by private parties in PPP contracts is linked with better institutions in the form of better regulatory framework.

Furthermore, PS is not significant as far as domestic private investment is concerned although it has negative coefficient of -0.0469. The negative coefficient in this study means, political environment in SSA countries need improvement to attract investors in invest in the region. Le (2004) in his study disclosed that socio-

political stability surrounded by peaceful protest encourages investment but violent revolutions stop an upsurge in domestic private investment.

Government effectiveness is significant and positive at one (1) percent significance level. The positive coefficient of government effectiveness means positive association between government effectiveness and domestic private investment. Thus, a unit improvement in government effectiveness, would cause an upsurge in the domestic private investment approximately by 9.25 units. The positive effect of government effectiveness also implies that if governments of SSA countries focus on inputs needed to formulate and implement good policies in their respective economies and that there is an improvement in the quality of bureaucracy and governments are committed to implementing the policies formulated to provide congenial business environment, there will be an increase in domestic private investment in SSA economies. Alam, Kiterage and Bizuayehu (2017) in their studies find out that GE produce positive impact on economic growth.

The coefficient of aggregated institutional variables is statistically important and positive at one (1) percent significance level. This regression result indicates that the composite institutional variable indeed has positive influence on the domestic private investment in Sub-Saharan African nations. Thus, improvement in institutional variables will positively affect the domestic private investment. For example, a unit upsurge in the composite or aggregated index of the institutional variables, would cause domestic private investment to surge by 2.81 units. (Morrissey & Udomkerdmongkol, 2012, Buchanan et al., 2012), stated that private investment is larger within states where there are good institutions.

The domestic public investment is statistically significant and negative at 10 percent in the models' one, two, three, six and seven. The coefficient of this variable ranges from -0.118 to -0.186. The negative coefficient implies negative correlation between domestic public investment and domestic private investment. For instance, 1 percent decrease in domestic public investment would cause domestic private investment to decrease by 0.186 percent. This result means that domestic public investment crowd-out domestic private investment in Sub-Saharan Africa states. The result of this study confirms that of Cruz and Teixeira (1999) that domestic public investment crowd-out domestic private investment in the short-run in Brazil. Besides, Sundararajan and Thukur (1980) carried out empirical studies on India and Korea. Their result revealed that domestic public investment crowd-out domestic private investment in India while crowd-in in Korea.

Furthermore, foreign direct investment (FDI) is statistically significant and positive at 1percent in all seven models with estimated coefficients ranging from 0.110 percent to 0.116 percent. This implies that if FDI rise by 1%, the domestic private investment would upsurge up to 0.116 percent. Thus, FDI can produce complementary effects of crowding-in domestic private investment in SSA countries. Accordingly, the complementary impacts can be explained by many mediums, particularly the positive externalities, the infrastructures, the connection impacts or effects, upsurge in the domestic demand for goods and services, and more commonly wider nature of business opportunities available in the home economy or country (Moran, 2011; Görg & Greenaway, 2004; Cardoso & Dornbusch, 1989). Based on the literature reviewed, the type of FDI which could

cause the domestic private investment to increase are in the form of high technology, communication network and energy. For instance, the findings of Ndikumana and Verick, (2008); Agosin and Mayer, (2000), confirm this result.

Besides, GDP growth is also statistically significant and positive at 1 percent in models' two and six, 5 percent in models' one and five and 10 percent in models' three, four and seven respectively. The coefficient of GDP ranges from 1.680 to 3.673. This also signifies positive association between GDP growth and domestic private investment in SSA states. Thus, if GDP growth rises by 1 percent the domestic private investment on the whole will increase approximately by 3.7 percent in SSA countries. Furthermore, the works of Jongwanich and Kohpaiboon (2008), Ouattara (2004) and Sakr (1993) confirm the above empirical finding of positive association between gross domestic product growth and domestic private investment.

The coefficient of domestic credit to private sector is negative in models one and four and positive in the rest four models, but in all cases not statistically significant. The negative coefficients imply that domestic credit to the private sector have potential to affect domestic private investment negatively in SSA countries. This however, is contrary to the existing literature reviewed. The negative sign shows domestic credit to private sector has the potential to decrease domestic private investment. This was confirmed by the finding of Ouattara (2004). In my opinion, the negative effect of domestic credit to private sector on domestic private investment in SSA countries, is as a result of excessive foreign borrowings by SSA governments which principal and interest payment have to be internally

financed by borrowing from the domestic financial institutions. When this happened, the private sector is crowded out by governments' borrowings internally.

The external debt in model two is statistically significant at 10 percent. The coefficient of external debt ranges from 0.726 to 1.198. Positive coefficient implies positive association between external debt and domestic private investment. This illustrates that if external debt increases by say \$1, then domestic private investment will rise by 1.198 percent. The regression result in this study, is quite different from the findings of Krugman (1998) and Sachs (1989b) which indicated that, large external debt of governments usually has the potential to reduce domestic private investment. They argued that external debt to government serves as a source of macroeconomic instability since it depends mostly on world interest charges (rates) and terms of trade, influences (factors) that are beyond the control of the debtor country and as such instability will automatically impacts policies on the private sector capital formation. Again, Abdullahi, Abu and Hassan (2016) indicated their work, debt overhang versus crowding out effects and indicated that external debt in particular is a necessary evil for all economies to survive with. They further pointed out that external debt in Sub-Saharan Africa states have adversely affected domestic private investment. However, the positive coefficient of 1.198 of external debt in this study rather signifies that SSA countries invest the money borrowed from the Western World into public infrastructure which serve as a complement to the domestic private investment.

Inflation is the next control variable which is not statistically important but have negative coefficient values in all the estimated models. The negative

coefficient implies that inflation has the potential to impact negatively domestic private investment in SSA nations. Thus, the prices of goods and services in the SSA countries are high that they have the potential to affect the purchasing power which indirectly affect domestic private investment. Feldstein (1980)'s work on inflation, tax rules, and investment: some econometric evidence, find out that the interaction of inflation and existing tax rules has contributed substantially to the decline of business investment.

Trade has a positive and statistically substantial effect at one (1) percent in all the estimated models. The positive coefficient means direct relationship between trade and domestic private investment. The coefficient of trade ranges from 0.0545 to 0.0620. Thus, if trade (net export) rises by one (1) percent, the domestic private investment would also increase by approximately 0.062 percent. Rodrik (1997) confirmed in his work that trade boom (exports and imports) causes investment boom. To him surplus funds from trade boom is used to acquire capital goods which increases investment in the long run.

Debt service is statistically not significant but has negative coefficient in all the estimated models of this study. Debt service may adversely affect domestic private investment in SSA economies. This happens when government use all the revenue generated for both principal and interest payment of the money borrowed abroad. This therefore, prevent the government from embarking upon massive domestic public investment or infrastructures which serves as a complement to domestic private investment. Edo (2002) in his quest to finding determining factors of foreign debt accumulation with specific attention on Nigeria and Morocco,

concluded that foreign loans servicing and accumulation has severely and negatively affected investment in the two countries.

Institutions and Domestic Public Investment

This section discusses impacts of institutions on domestic public investment. To dodge the problem of multicollinearity, the institutional variables are introduced into the model independently.

Table 4: Effect of institutions on domestic public investment

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
DPriI	-0.102* (0.0430)	-0.117* (0.0455)	-0.113* (0.0445)	-0.0796 (0.0445)	-0.0850 (0.0439)	-0.117* (0.0456)	-0.113* (0.0445)
DCPS	0.00222 (0.00157)	0.00272 (0.00159)	0.00292 (0.00159)	0.00287 (0.00161)	0.00272 (0.00161)	0.00283 (0.00159)	0.00292 (0.00159)
FDI	0.0194 (0.0205)	0.0188 (0.0209)	0.0186 (0.0208)	0.0149 (0.0211)	0.0151 (0.0210)	0.0169 (0.0209)	0.0186 (0.0208)
EXBEDT	-1.016* (0.406)	-0.849* (0.420)	-0.962* (0.413)	-1.110** (0.428)	-0.964* (0.425)	-0.996* (0.413)	-0.962* (0.413)
GDP	2.473*** (0.700)	2.487*** (0.726)	2.034** (0.703)	2.135** (0.717)	2.119** (0.714)	2.320** (0.713)	2.034** (0.703)
DEBTSERV	0.572* (0.244)	0.698** (0.245)	0.690** (0.244)	0.753** (0.246)	0.769** (0.246)	0.749** (0.244)	0.690** (0.244)
INFLA	-0.0427* (0.0195)	-0.0417* (0.0198)	-0.0426* (0.0198)	-0.0423* (0.0200)	-0.0417* (0.0200)	-0.0403* (0.0198)	-0.0426* (0.0198)
TRADE	0.0276** (0.0104)	0.0284** (0.0106)	0.0312** (0.0106)	0.0263* (0.0107)	0.0285** (0.0108)	0.0298** (0.0106)	0.0312** (0.0106)
VA	4.494*** (1.112)						
CC		3.124* (1.284)					
RL			3.700** (1.349)				
RQ				-1.023 (1.368)			
PS					0.475 (0.557)		
GE						3.212* (1.355)	
INST							2.190** (0.799)
Const.	-36.66* (15.38)	-42.91** (16.13)	-29.81 (15.61)	-33.37* (15.76)	-35.65* (16.04)	-36.49* (15.69)	-32.33* (15.57)

Table 4 continued

N	336	336	336	336	336	336	336
Hausman(X^2)	33.74	28.04	27.47	20.55	23.36	26.43	27.47
Prob>chi2	0.0001	0.0009	0.0012	0.0148	0.0054	0.0017	0.0012
Pesaran CD test for serial correlation	-0.618(Pr. = 0.5365)	-1.090(Pr. = 0.2759)	-0.993(Pr. = 0.3206)	-1.013(Pr. = 0.3111)	-1.116(Pr. = 0.2643)	-1.050(Pr. = 0.2936)	-0.993(Pr. = 0.3206)

DPriI =domestic private investment, DPuI = domestic public investment, DCPS = domestic credit to the private sector, FDI = foreign direct investment, EXDEBT = external debt, GDP = gross domestic product, INFLA = inflation, VA = voice and accountability, CC = control of corruption, RL= rule of law, RQ=regulatory quality, PS=political stability and absence of violence/ terrorism and INS = composite index of the institutional variables.

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Galah (2020).

As usual, table 4 displays regression results of fixed effects models for domestic public investment (dependent variable), and the seven institutional variables of interest with some control variables. The second purpose of this study is “to examine the effects of institutions on domestic public investment”. Besides, to check for the model fitness, Hausman test was executed. The null hypothesis (H0): “Random effects model is appropriate” and the alternative (H1): “Fixed effects model is appropriate”. The test selected the alternative hypothesis, fixed effects techniques as more fitting for all the estimated models. Thus, their probability value is smaller compared to 0.05 decision rule of thumb. Hence, the null hypothesis was rejected as not suitable for the estimated models. Furthermore, the random effects models rejected have been presented in Appendix D.

Typically, serial correlation test was executed to find out the existence of endogeneity. Hence, Pesaran Cross-Sectional Dependence test was performed. The test shows no serial association between the disturbance term and regressors in all the estimated models in the table 4 above.

Model one (1) indicates that voice and accountability is statistically significant and positive at one (1) percent significance level with coefficient value

of 4.494. This signifies that voice and accountability have direct association with domestic public investment in Sub-Saharan African countries. Thus, the result indicates that when voice and accountability increase by one-unit, domestic public investment will increase by 5 units in SSA countries. Again, the positive index of voice and accountability depicts a good institution. It also implies that citizens of SSA countries usually participate in the choice of their governments. This therefore, hinge on the premise that there is freedom of expression and association, and the independence of media in SSA countries. Besides, the free media produce a significant role in monitoring government officials and holding them answerable for their actions. With this result, SSA countries are safe for both foreign and domestic investors to invest. Thus, the value of voice and accountability indicates transparency and accountability of governments in SSA countries. Entrepreneurs (investors) particularly, desire a transparent institutional atmosphere in the sense that it decreases risk and uncertainty in transacting businesses. Besides, transparency aids entrepreneurs to avoid fixed or sunk costs as lack of transparency is most often connected with corruption. According to Nadeem, Jiao, Nawaz and Younis (2020) low voice and accountability could result to low institutional setting, favouritism which may have adverse effect on domestic public investment. They further specified that higher voice and accountability signifies the presence of good of institutions which will enhance investment decision making of investors.

Furthermore, CC is statistically significant at 10 percent and have positive coefficient of 3.124. This however, implies that control of corruption has potential to influence domestic public investment in SSA countries grounded on the

regression results of this study. Thus, a unit improvement of control of corruption, would cause domestic public investment to increase by 3.12 units. This also implies that absence of corruption would create a business-friendly environment for the economies of SSA countries. The work of Nunnenkamp (2004) confirmed that countries which have level of low corruption to a high degree would impact positively on domestic private investment.

Rule of law is statistically important and positive at 5 percent significance level with the index value of 3.7. The positive index implies that rule of law has potential to influence domestic public investment positively. Hence, a unit improvement in the rule of law, would cause domestic public investment to upsurge approximately by 4 units. In the nutshell, this result suggests that in Sub-Saharan Africa countries, property rights are protected. Thus, there is high enforceability of contracts, fairness of police involvement, and efficiency as well as predictability of the judiciary (courts) systems. Rule of law is therefore, an institutional determinant of domestic public investment in SSA. Globerman and Shapiro (2002) indicated that countries which invest adequately in institutions, it helps them to place their business environment in position to attract more capital, and as well offer an opportunity to their domestic multinational corporations to invest abroad.

The regulatory quality produces negative coefficient of -1.023 though not statistically important. This implies that regulatory quality has the potential to influence domestic public investment. This could mean that governments in SSA countries formulate and implement policies and rules which do not permit and encourage private sector growth. On the other hand, it could be interpreted to mean

that these policies are not market-friendly in terms of foreign trade and domestic business expansion in the domestic economies. Ngo (2017) in his work found regulatory quality to be negative but statistically significant. He explained the negative index to reflect the burdens imposed by excessive regulation. He further continued that when policies are stricter (not relaxed), it will probably imply that investors would have to meet demanding requirements in order to obtain permission; which may affect the process of their investment. In this study, even though regulatory quality is not statistically important, the negative coefficient of regulatory quality shows it may have the potential to affect domestic public investment.

Again, PS is not statistically significant although have positive index. This result suggests that political stability is not an institutional variable that could influence domestic public investment in SSA countries in this study.

Government effectiveness is statistically significant at 10 percent and have positive coefficient of 3.212. Therefore, it implies that government effectiveness may produce positive influence on domestic public investment in Sub-Saharan Africa economies. Thus, a unit improvement of government effectiveness (GE), would cause domestic public investment to increase by 3.2 units. This implies positive relationship between GE and domestic public investment in SSA countries. This result also means that both public and civil services perform their functions devoid of political interference.

The composite or aggregated institutional variable is statistically substantial and positive at 5 percent significance level with the coefficient (2.190).

This result suggests that institutional variables indeed have positive influence on the domestic public investment in Sub-Saharan African countries. Thus, an improvement in the institutional variables will positively affect the domestic public investment. For example, a unit improvement in institutions, will cause domestic public investment to upsurge approximately by 2.2 units. Therefore, it is imperative that agencies in charge of the improvement of institutions in Sub-Saharan Africa economies, are up to the task to ensure institutions play enabling environment for businesses and infrastructure expansion. Coyne and Sobel (2010) indicated that the existence of good institutions decreases uncertainty and the cost of doing business.

Domestic private investment is statistically significant at 10 percent and have negative coefficient ranging from -0.0796 to -0.117. This simply implies there is negative association between domestic private investment and domestic public investment. Thus, if the domestic public investment decrease by 10 percent, domestic private investment will also decrease by 0.12 percent. This shows that domestic private investment complement domestic public investment in SSA countries.

Furthermore, external debt is statistically important but negative at 5 percent in model four and 10 percent for models one, three, five, six and seven respectively. The coefficient ranges from -0.849 to -1.110. The negative index of external debt implies an indirect correlation between external debt and domestic public investment. Thus, if the external debt increases by \$1, domestic public investment will decrease by 1.11 percent. This is so because SSA governments usually borrow monies from the Western World. The principal and interest

repayment of these loans make them unable to embark upon domestic public investment which serves as complement to the domestic private investment.

Again, inflation is statistically significant at 10 percent though negative in all the estimated models. It therefore, have the potential to reduce domestic public investment. Trade has positive coefficient and statistically significant at 5 percent for all the estimated models except model four which is significant at 10 percent. The positive coefficient means trade impact domestic public investment positively. This implies that 5 percent increase in trade (net export), will cause domestic public investment to rise by 0.0312 percent. GDP also is statistically significant and positive at 1 and 5 percent for models' one and two, and three, four, five, six and seven respectively. This connotes positive association between GDP and domestic public investment. Finally, debt service produced positive coefficients and statistically important at 5 and 10 percent for model two to seven and one correspondingly. This result is contrary to the literature reviewed. The result shows positive correlation between debt service and domestic public investment. This implies that if debt service increases by \$1, domestic public investment will upsurge by 0.753 percent. In my opinion, this result implies that governments in SSA countries invest monies borrowed abroad into infrastructures which serves as a catalyst for an increase in domestic private investment and hence, economic growth. Thus, in course of financing deficit budgets, chunk of the borrowed funds is allocated to domestic public investment which complement domestic private investment.

Moderating Role of Institutions

This section discusses joint effects of institutional variables and FDI on domestic private investment. However, to avoid problem of multicollinearity, the institutional variables are introduced into the model individually.

Table 5: Moderating effect of institutions and FDI on domestic private investment

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GFCFpub	-0.155* (0.0739)	-0.192** (0.0721)	-0.152* (0.0727)	-0.125 (0.0714)	-0.127 (0.0733)	-0.170* (0.0713)	-0.152* (0.0727)
DCPS	-0.000424 (0.00209)	-0.0000188 (0.00202)	0.000272 (0.00206)	-0.000318 (0.00203)	0.000285 (0.00209)	0.0000659 (0.00200)	0.000272 (0.00206)
FDI	0.0596 (0.0424)	0.0303 (0.0719)	0.214 (0.133)	0.678*** (0.125)	0.0188 (0.0494)	0.495** (0.150)	0.141** (0.0441)
Ext	0.617 (0.535)	1.138* (0.529)	0.852 (0.528)	1.130* (0.524)	0.642 (0.543)	0.798 (0.517)	0.852 (0.528)
GDP	2.491** (0.781)	3.828*** (0.914)	1.849* (0.768)	1.256 (0.752)	2.353** (0.767)	3.109*** (0.884)	1.849* (0.768)
DEBT	-0.353 (0.320)	-0.425 (0.312)	-0.310 (0.318)	-0.111 (0.313)	-0.293 (0.320)	-0.229 (0.307)	-0.310 (0.318)
INFLA	-0.0383 (0.0260)	-0.0350 (0.0253)	-0.0464 (0.0255)	-0.0450 (0.0252)	-0.0426 (0.0258)	-0.0291 (0.0249)	-0.0464 (0.0255)
TRADE	0.0516*** (0.0131)	0.0557*** (0.0131)	0.0552*** (0.0128)	0.0490*** (0.0125)	0.0501*** (0.0131)	0.0539*** (0.0133)	0.0552*** (0.0128)
VA	2.462* (1.223)						
VA_FDI	-0.120 (0.0738)						
CC		9.217*** (1.632)					
CC_FDI		-0.114 (0.0899)					
RL			4.379** (1.417)				
RL_FDI			0.108 (0.140)				
RQ				1.097 (1.381)			
RQ_FDI				0.548*** (0.118)			
PS					0.605 (0.717)		
PS_FDI					-0.198* (0.0879)		
GE						7.686*** (1.721)	
GE_FDI						0.323** (0.124)	

Table 5 continued

INST							2.592** (0.839)
INST_FDI							0.0637 (0.0826)
Const.	-50.39** (15.39)	-86.19*** (19.94)	-40.13** (15.10)	-38.85** (14.21)	-49.91*** (15.14)	-66.54*** (19.29)	-43.11** (15.00)
N	336	336	336	336	336	336	336
Hausman(X^2)	4.19	18.88	6.68	10.54	5.09	17.48	6.68
Prob>chi2	0.9386	0.0262	0.7554	0.2292	0.8851	0.0417	0.7553
Pesaran CD test for serial correlation	0.347(Pr. = 0.7287)	0.887(Pr. = 0.3753)	0.181(Pr. = 0.8561)	-0.408(Pr. = 0.6829)	-0.030(Pr. = 0.9757)	0.049(Pr. = 0.9606)	0.181(Pr. = 0.8561)

DPriI =domestic private investment, DPuI = domestic public investment, DCPS = domestic credit to the private sector, FDI = foreign direct investment, EXDEBT = external debt, GDP = gross domestic product, INFLA = inflation, VA = voice and accountability, CC = control of corruption, RL= rule of law, RQ=regulatory quality, PS=political stability and absence of violence/ terrorism and INS = composite index of the institutional variables.

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$,

Source: Galah (2020).

Table 5 above exhibits the regression results of fixed effects (FE) and random effects (RE) Models for an interaction of the institutional variables and foreign direct investment (FDI) on the domestic private investment (regressand) with some control variables. Typically, Hausman test was executed to select suitable estimation techniques for the analysis. The null hypothesis (H0): “Random effects model is appropriate” and the alternative (H1): “Fixed effects model is appropriate”. The decision rule is that if the probability value is less than 0.05, then the null hypothesis should be discarded. Else, don’t reject the alternative hypothesis that FE model is more suitable compared to random effects model. However, grounded on Hausman test results for this study, the null hypothesis (random effects model) is selected for models one, three, four, five and seven while the test also selected fixed effects techniques for models two and six.

As usual, the serial correlation test was executed to determine the presence of endogeneity problem. Pesaran Cross-Sectional Dependence test was executed. The null hypothesis (H0): “There is no serial correlation” and the alternative

hypothesis (H1): “There is serial correlation”. The test revealed that there is no serial relationship between the error term and regressors. Thus, the null hypothesis was not rejected of no serial relationship (endogeneity) for all the seven models in table 4.4 above.

Voice and accountability (VA) alone is statistically significant at 10 percent and positive with coefficient of 2.462. This implies that VA has a positive correlation with domestic private investment. Thus, a unit improvement in VA, it would cause about 2.5 units increment in domestic private investment. Furthermore, the mediation between voice and accountability and FDI is also not statistically significant but has negative coefficient of 0.12. This implies that the interaction between voice and accountability and FDI have the potential to influence domestic private investment negatively. This result is contrary to that of Sabir, Rafique and Abbas (2019) which indicate that voice and accountability have positive influence on FD inflows into a country.

Again, control of corruption alone, is statistically significant and positive at one (1) percent significance level with the coefficient of 9.217. This means a unit improvement in CC, will cause domestic private investment to also increase approximately by 9.2 units in SSA economies. This positive coefficient implies a good institution and as such deemed to mean fewer corruption cases. Corruption is significant determining factor of domestic investment in SSA countries. The empirical result of control of corruption alone, indicates that there is less degree to which public power is employed for private again, be it small and or outstanding forms of corruption, perpetrated by nation officials and private interests in SSA

countries. Thus, the absence of corruption, would create a business-friendly environment for the economies of SSA. Besides, the interaction between control of corruption and foreign direct investment (CC_FDI) is not statistically important though it has a negative coefficient of 0.114. Since the mediation between CC and FDI as well as FDI alone is not statistically important, net effect or partial effect cannot be computed. Notwithstanding, the negative coefficient of (CC_FDI) depicts that when SSA countries have weak control of corruption within the face of foreign direct investment, domestic private investment will decrease. Ashraf and Herzer (2014) pointed out that Mergers and Acquisitions do not have a negative impact on domestic investment. Although, greenfield or completely new inflows of FDI appears to have a displacing or crowding-out impact on domestic investment. Therefore, the negative coefficient of CC_ FDI though not statistically significant, has the possibility to reduce domestic investment be it in the form of greenfield or completely new influxes of foreign direct investment which may have displacing influence on domestic private investment in Sub-Saharan Africa countries.

Rule of law alone has positive coefficient of 4.379 and statistically significant at five (5) percent. This implies that a unit improvement in rule of Law, domestic private investment will rise approximately by 4.4 units in SSA economies. The positive coefficient of rule of law implies a good institution in SSA countries. This empirical result indicates that an improvement of the property rights protection, proper contracts enforcement, fairness of police involvement, and the efficiency and predictability of the judiciary (courts) system, would cause domestic private investment to increase. Furthermore, the coefficient of the mediation

between $RL*FDI$, is not statistically important though positive. This implies that it may not have positive influence on the domestic private investment in this study.

The regulatory quality alone is not statistically important although positive. Therefore, much cannot be said of its impact upon domestic private investment. However, mediation between regulatory quality and foreign direct investment is statistically imperative and positive at one (1) percent significance level with the coefficient of 0.548. Again, net or partial effect could not be obtained to explain the influence of the mediation of regulatory quality and FDI on domestic private investment, simply because the RQ alone is not statistically important in this model. Therefore, the coefficient of $RQ*FDI$ (0.545) is used in this analysis instead. The coefficient (0.548) of $RQ*FDI$ means a unit improvement in regulatory quality in the presence of foreign direct investment in SSA countries, would upsurge domestic private investment by 54.8 percent. This was supported by Farla et al. (2016), that FDI inflows crowd-in domestic investment in a situation where there are good institutions. Said, Ochi and Ghadri (2013) indicated in their studies that regulatory quality has important influence on foreign direct investment in both developed and developing countries. The positive coefficient of $RQ*FDI$ implies that governments in SSA countries formulate and implement comprehensive policies and rules which allow and encourage private sector development and as such, FDI crowd-in domestic private investment. This also means SSA governments implement market enabling environment policies to attract foreign trade and enhance businesses in their domestic economies.

Besides, the coefficient of FDI alone confirms the result of $RQ*FDI$. The coefficient of foreign direct investment is statistically important and positive at one (1) percent. This result expresses direct association between FDI and domestic private investment. Thus, if foreign direct investment rises by one (1) percent, the domestic private investment will rise approximately by 0.678 percent. This implies foreign direct investment crowds-in domestic private investment.

PS alone is not statistically significant though it has positive coefficient. This means that PS alone may not affect domestic private investment in this study. However, the mediation between political stability and FDI is statistically important at 10 percent significance level with negative coefficient of 0.198. Furthermore, the net effect cannot be found in this model too because, both PS and FDI individually are not statistically significant. Therefore, the mediation effect between FDI and PS can only be explained using the interactive coefficient of -0.198. The coefficient of PS_FDI (-0.198) suggests that a unit improvement in PS in the face (presence) of foreign direct investment in SSA countries will decrease domestic private investment by 19.8 percent. For instance, in the work of Saidi, Ochi and Ghadri (2013), they indicated that political stability influences foreign direct investment positively. They indicated foreign investors are interested in political stability as one of factors in their choice of investment abroad. However, the negative coefficient value in this study indicates an inverse association between PS_FDI and domestic private investment. This coefficient depicts the presence of political instability and terrorism in SSA countries. Blonigen, (2005) and Dawson,

(1998), pointed out in their studies that PS has a negative and statistically significant influence on domestic investment within developing states.

Individually, government effectiveness and foreign direct investment are both statistically significant and positive at one (1) and five (5) percent significance level separately. Furthermore, there is the need to take into consideration the mediation effect between government effectiveness and FDI by calculating the partial effect on the domestic private investment.

The partial impact of government effectiveness on domestic private investment is as follows:

$$\frac{\delta D_{priI}}{\delta GE} = \beta_1 + \beta_6 INS * FDI_{it} (FDI)$$

$$\frac{\delta D_{priI}}{\delta GE} = 7.686 + 0.323 (FDI)$$

Putting in the mean value of FDI as obtained from the descriptive statistics;

$$\frac{\delta D_{priI}}{\delta GE} = 7.686 + 0.323(5.311827)$$

$$\frac{\delta D_{priI}}{\delta GE} = 7.686 + 1.715720$$

$$\frac{\delta D_{priI}}{\delta GE} = 9.401720$$

This means that a unit rise in the government effectiveness index, in the face of foreign direct investment increases domestic private investment approximately by 9.4 units. The net coefficient values (9.401720) of GE*FDI indicates positive association between GE*FDI and domestic private investment in SSA countries. Again, it implies that governments of SSA countries formulate and implement good policies. The positive net coefficient in this study also revealed that there is less bureaucracy, and governments are committed to implementing the policies

formulated to provide congenial business environment within the presence of foreign direct investment for domestic private investment to thrive in SSA countries. Besides, this result could also be interpreted to mean an improvement of public and civil services and as well as their independence from political interference. This therefore, makes business environment more accommodating for new entrants as well as the existing firms to invest, be it foreign or domestic firms. Sabir, Rafique and Abbas (2019) in unbundling institutions in their studies, indicated that government effectiveness has positive impact on the FDI in both developed and developing countries. Again, Gangi and Abdulrazak (2012) specified in their work that GE has positive influence on foreign direct investment inflows to Africa countries.

Finally, the composite index of all the institutional variables is statistically important and positive at five (5) percent significance level. This reaffirms similar results in this study. Thus, institutions have an important influence on domestic private investment. Based on the composite index of the institutional variables (2.592), it implies that a unit enhancement of institutions will upsurge domestic private investment approximately by 3 units. This implies positive relationship between institutions and domestic private investment. Additionally, the mediation between the composite index of institutional variables and FDI (INS_FDI) is not statistically important though has positive coefficient. This means that the aggregation of all institutions in the presence of the FDI do not have an impact on the domestic private investment in Sub-Saharan African nations.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents summary, conclusions and recommendations of the study. The summary displays the overall outcome of the study in light of a brief overview of the objectives, methodology and problem statement. Conclusions were hinged on major findings and research hypotheses of the study. Besides, recommendations were suggested to relevant bodies.

Summary

The main purpose was to examine the effect of institutions and foreign direct investment on domestic investment in Sub-Saharan Africa over the period 2006-2017. The study further investigates the effects of institutions on domestic private and public investments as well as the moderating effects of institutions and foreign direct investment on domestic private investment. The study however, employs static panel data method grounded on fixed and random effects estimation techniques on twenty-eight Sub-Saharan Africa countries over twelve-year period. Data for this study were obtained from World Development Indicator (WDI) and World Governance Indicators (WGI).

The study is motivated by the fact that institutions matter for capital formation in Sub-Saharan Africa countries. North (1990) indicated that development depends largely on the institutional factors that prevail in a particular economy. This implies that for development to take place, the institutional environment must be developmentally oriented. Besides, majority of the existing

studies on capital formation, focus largely on economic factors which are cyclical in nature. Therefore, considering the political history of Sub-Saharan African countries, institutions may go a long way to affect domestic investment. Hence, it is imperative to study how these institutions affect domestic investment.

From the findings, it is observed that under the first purpose of this study “to examine the effect of institutions on domestic private investment”, four out of six institutional indicators are statistically significant at one (1) and ten (10) percent respectively, revealing that they have substantial effects on domestic private investment. These results are in line with a huge body of past literature indicating that institutional quality is very important to domestic investment. I find out in this study that rule of law, control of corruption, government effectiveness and regulatory quality positively affect domestic private investment whereas, political stability and absence of terrorism have negative correlation with domestic private investment. Furthermore, the reverse correlation of political stability and absence of terrorism with domestic private investment ought not be understood as just support for weak institution but an indication to improve upon it in SSA countries.

The unexpected sign of political stability and absence of terrorism may be explained based on the characteristics of Sub-Saharan Africa institutions. The SSA countries have special features of terrorism, violence, coup d’etat and civil unrest or wars. These characteristics are unfriendly to business environment. In the works of Nunnenkamp (2004), Li et Resnik (2003), Rogoff and Reinhart (2003) and Wei and Wu (2001), Political instability, legal uncertainty produced negative and statistically significant effect on domestic investment. This would mean that

politically, the investment climate in SSA economies will not be accommodative to domestic private investors. Besides, voice and accountability have positive coefficient although not statistically important. This implies that voice and accountability may not have an effect on domestic private investment.

Again, the composite index value of the six institutional indicators is statistically significant and positive at one (1) percent in this study. This implies that institutions impact domestic private investment positively in Sub-Saharan African nations.

Furthermore, the findings based on the second objective “to investigate the effects of institutions on domestic public investment”, four institutional variables are statistically significant at one (1), Five (5) and ten (10) respectively. These are voice and accountability, rule of law, control of corruption and government effectiveness. This therefore, implies that voice and accountability, rule of law, control of corruption and government effectiveness, positively impact domestic public investment. Regulatory quality rather produced negative coefficient. The negative coefficient makes it have an inverse association with domestic public investment. The unexpected (negative) sign of regulatory quality may be explained by the characteristics of the SSA countries. This study can interpret this result to mean that Sub-Saharan Africa states formulate good policies but the problem remains with implementation to create conducive public sector development. Therefore, regulatory quality in SSA countries may impact domestic public investment negatively. This will in turn affect the domestic private investment negatively, simply because the public investment complements private investment.

In line with expectation, the study found out that the interaction between regulatory quality and foreign direct investment, government effectiveness and foreign direct investment positively affect domestic private investment. Thus, the RQ_FDI and GE_FDI are both statistically significant and positive at one (1) and five (5) percent separately. This implies that SSA economies implement sound policies and create independencies of their public and civil services with less bureaucracy, which serve as a catalyst to attract foreign direct investment that enhances (crowd-in) domestic private investment. This also implies that an improvement of regulatory quality and government effectiveness in the presence of FDI, domestic private investment will increase. Besides, mediation between political stability and absence of terrorism and foreign direct investment is statistically significant at 10 percent and have negative impact on domestic private investment. This means a unit rise in political instability and presence of terrorism in the face of FDI, domestic private investment will fall in Sub-Saharan African nations. Thus, foreign direct investment inflows crowd-out domestic private investment. This result implies that political instability impacts domestic private investment negatively. Again, mediation between voice and accountability and FDI as well as control of corruption and FDI are not statistically important. However, coefficient of mediation between control of corruption and foreign direct investment (CC_FDI) produces negative effect on domestic private investment. In the nutshell, when there is political instability, judicial (court system) cannot be predicted to protect property right and prevent high corruption cases, it may create avenues for FDI to crowd-out domestic private investment.

Conclusion

In conclusion, the study's principal and specific objectives were generally achieved and the null hypotheses were largely rejected. Specifically, on the whole, the findings failed to accept the first null hypothesis that “institutions do not affect domestic private investment”.

The results shown that composite institutional variables have positive impact on domestic private investment in Sub-Saharan Africa countries. This means improvement on institutions in Sub-Saharan Africa states will enhance domestic private investment.

However, in disaggregating the institutional variables, rule of law, control of corruption, government effectiveness and regulatory quality are statistically important and have positive effect on domestic private investment whiles political stability and absence of terrorism have a negative effect and voice and accountability has no impact on domestic private investment.

Similarly, the second null hypothesis “institutions do not affect domestic public investment” was not fully rejected in its entirety. Although aggregated institutions produced positive effect on domestic public investment. Meaning institutions play important function on domestic public investment in SSA nations.

Nevertheless, in disaggregating the institutional variables, the results indicate that voice and accountability, control of corruption, rule of law and government effectiveness produced positive effects on domestic public investment in SSA nations. Political stability and absence of terrorism, do not actually affect

domestic public investment. Besides, taking a cursory look at regulatory quality, its result indicates negative impact on the domestic public investment.

Again, the study failed to reject the third null hypothesis “there is no joint effect of institutions and foreign direct investment on domestic private investment” in total. Though the aggregated institutional variables interacted with foreign direct investment do not have statistically significant impact on domestic private investment.

However, in disaggregating institutional variables, the study found out that interaction between regulatory quality, government effectiveness and foreign direct investment produced positive impact on the domestic private investment while political stability and foreign direct investment have adverse impact on the domestic private investment. These results signify that an improvement in regulatory quality and government effectiveness in the presence of foreign direct investment, domestic private investment increase whereas, a unit increase in the political instability in the face of FDI, will decrease domestic private investment.

Furthermore, voice and accountability, control of corruption and foreign direct investment have negative effects on domestic private investment though not statistically significant. Rule of law and foreign direct investment do not produce any impact on the domestic public investment.

Recommendations

Having considered the findings and conclusions of this study very carefully, the following recommendations are given:

The results shown that composite institutions have positive impact on domestic investment in Sub-Saharan Africa countries. Therefore, the study recommends that institutional environment matters when it comes to domestic investment, hence various governments and political leaders must strive to maintain high quality institutions in SSA countries.

The result specified that political stability and absence of terrorism have a negative effect on domestic private investment. The study however, recommends that governments of Sub-Saharan Africa states should collaborate with each other on regional groupings to find lasting solution to deal with the political instability and presence of terrorism in the sub-regions. Thus, democracy should be promoted by enhancing the citizens' engagement via dialogue in Sub-Saharan Africa countries to enhance private sector development. The study again, recommends improvement of the adversarial nature of politics in Sub-Saharan Africa countries.

The result indicates that regulatory quality produced negative impact on domestic public investment. The study again, recommends that the institutional agents in Sub-Saharan Africa countries should attempt to improve upon rigid regulatory quality policies to increase the size of formal private sector through the documentation and registration processes. Additionally, the acute shortage of managerial personnel in public establishments create a severe limitation to the execution of policies in the public sector in SSA countries. Therefore, managements training ought to be the highest priority of public agencies based on institutions implementations.

Furthermore, the result shows the unbundled institutional variables; rule of law, control of corruption, government effectiveness and regulatory quality are statistically significant and have positive effect on domestic private investment. The study therefore, recommends that these institutions are good determining factors of domestic private investment in SSA, hence government agencies and political leaders should constantly improve upon them to enhance private sector development in the Subregion.

The results specify that disaggregated institutional variables; voice and accountability, control of corruption, rule of law and government effectiveness produced positive effects on domestic public investment in SSA nations. The study again, recommends that public and civil services should effectively implement them to enhance domestic public investment in the region.

Lastly, the results signify that government effectiveness in the presence of foreign direct investment, domestic private investment increases. The study therefore, recommends that government effectiveness must be strongly protected within the Subregion. This is because government effectiveness and foreign direct investment jointly will improve domestic private investment in SSA countries. Furthermore, the result shows that voice and accountability, control of corruption and foreign direct investment produced negative effects on domestic private investment. The study again, recommends that the civic society groups in SSA countries should be deeply involved in strengthening prevention and fighting of corruption in every level as well as ensuring free media to attract more foreign direct investment inflows that will crowd-in domestic private investment.

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APPENDICES

Appendix A: Pairwise Correlation Matrix

<i>Variables</i>	<i>DPuI</i>	<i>DPriI</i>	<i>FDI</i>	<i>DCPS</i>	<i>INFLA</i>	<i>TRADE</i>	<i>Ext</i>	<i>GDP</i>	<i>DEBT</i>	<i>VA</i>	<i>CC</i>	<i>RL</i>	<i>RQ</i>	<i>PS</i>	<i>GE</i>	<i>INS</i>
<i>DPuI</i>	1															
<i>DPriI</i>	-0.001	1														
<i>FDI</i>	0.054	0.132*	1													
<i>DCPS</i>	0.001	-0.015	-0.016	1												
<i>INFLA</i>	-0.252***	-0.037	-0.045	-0.077	1											
<i>TRADE</i>	0.219***	0.139*	0.339*	0.096	-0.098	1										
<i>Ext</i>	-0.167*	0.326***	-0.129*	0.091	0.155*	0.032	1									
<i>GDP</i>	-0.126*	0.306***	-0.156*	0.068	0.179*	-0.104	0.896*	1								
<i>DEBT</i>	-0.022	0.310***	-0.180*	0.020	0.103	0.068	0.842*	0.860*	1							
<i>VA</i>	-0.012	0.076	0.027	0.178*	-0.003	0.048	0.077	0.066	-0.018	1						
<i>CC</i>	0.053	0.146**	-0.006	0.141*	-0.010	0.174*	0.033	0.106	0.049	0.791***	1					
<i>RL</i>	0.010	0.175**	-0.055	0.124*	0.021	0.091	0.142*	0.196*	0.129*	0.819***	0.905***	1				
<i>RQ</i>	-0.044	0.220***	-0.109*	0.141*	-0.026	0.050	0.244*	0.302*	0.221*	0.774***	0.854***	0.925***	1			
<i>PS</i>	0.179**	0.047	0.009	0.101	-0.102	0.200*	-0.115*	-0.053	-0.023	0.691***	0.696***	0.736***	0.671***	1		
<i>GE</i>	-0.023	0.220***	-0.097	0.129*	0.019	0.097	0.317*	0.359*	0.295*	0.751***	0.850***	0.927***	0.943***	0.660***	1	
<i>INS</i>	0.010	0.175**	-0.055	0.124*	0.021	0.091	0.142*	0.196*	0.129*	0.819***	0.905***	1.000***	0.925***	0.736***	0.927***	1

Appendix B. List of Selected Sub-Saharan African Countries

1. Angola
2. Benin
3. Botswana
4. Burkina Faso
5. Burundi
6. Cameroon
7. Chad
8. Comoros
9. Congo, Dem. Rep
10. Congo, Rep.
11. Cote d'Ivoire
12. Eswatini
13. Gabon
14. Ghana
15. Guinea-Bissau
16. Liberia
17. Madagascar
18. Malawi
19. Mali
20. Mauritania
21. Mauritius
22. Niger
23. Sierra Leone
24. South Africa
25. Sudan
26. Tanzania
27. Togo
28. Uganda

Appendix C: Hausman Test Results

Objective 1 Model 1

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
VA	3.238027	1.988578	2.828314	.9339708
DPuI	-.1809675	-.1521838	-.0287837	.018308
DCPS	.0000603	-.000092	.0001523	.0002833
FDI	.1182153	.1139612	.0042542	.0050504
EXTDEBT	.7753265	.7257236	.0496029	.117662
GDP	2.990302	2.325324	.6649777	.6649777
DEBT SERVIC	-.3895428	-.3336934	-.0558495	.0658421
INFLA	-.0431859	-.0452815	.0020956	.0039426
TRADE	.0591335	.0545117	.0046218	.0041355

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\chi^2(9) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 4.82$$

$$\text{Prob}>\chi^2 = 0.8498$$

Model 2

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
CC	8.577006	8.577006	2.9986	.93303
DPuI	-.1857005	-.1498833	-.0358172	.0146444
DCPS	.000236	-.0000427	.0002787	.0002402
FDI	.1155639	.1122354	.0033285	.0046696
EXTDEBT	1.197848	1.008579	.1892691	.120935
GDP	3.672675	2.35166	1.321016	.5350268
DEBT SERVIC	-.4022272	-.3604857	-.0417414	.0501856
INFLA	-.0402664	-.0446111	.0043447	.0034932
TRADE	.0579294	.0510331	.0068964	.0039676

Test: Ho: difference in coefficients not systematic

$$\chi^2(8) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 16.11$$

$$\text{Prob}>\chi^2 = 0.0409$$

Model 3

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
RL	7.351695	4.747754	2.603941	1.052452
DPuI	-.186062	-.1547929	-.0312691	.0118891
DCPS	.0006971	.0002409	.0004562	.
FDI	.1167279	.1131263	.0036016	.0034049
EXTDEBT	.8631746	.8089156	.0542589	.0919394
GDP	2.536839	1.942862	.5939766	.4926081
DEBT SERVIC	-.3794055	-.3345556	-.0448499	.0329775
INFLA	-.0432467	-.0454208	.0021741	.00144
TRADE	.0645404	.0562561	.0082843	.003927

Test: Ho: difference in coefficients not systematic

$$\chi^2(9) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 13.56$$

$$\text{Prob}>\chi^2 = 0.1387$$

Model 4

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\chi^2(9) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
RQ	5.027728	3.495447	1.532282	1.073911
DPuI	-.1327661	-.118483	-.0142831	.0126216
DCPS	.0000926	-.0001272	.0002198	.0002013
FDI	.1162812	.1130023	.0032789	.0045016
EXTDEBT	1.157914	.9874517	.170462	.1376276
GDP	2.249526	1.679948	.5695783	.5032606
DEBT SERVIC	-.2199835	-.2372619	.0172784	.0475019
INFLA	-.0362459	-.0406097	.0043638	.003292
TRADE	.06165	.0548005	.0068495	.0042371

$$= 2.51$$

$$\text{Prob}>\chi^2 = 0.9807$$

Model 5

b = consistent under Ho and Ha

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
PS	-.0256696	-.0468545	.0211848	.3073568
DPuI	-.1457471	-.1322979	-.0134492	.015775
DCPS	.000396	.000175	.0002211	.0003291
FDI	.1166724	.1134474	.0032249	.0054548
EXTDEBT	.8069883	.7571393	.049849	.1350783
GDP	2.660133	2.199191	.4609419	.5250196
DEBT SERVIC	-.2826587	-.2797191	-.0029397	.0603375
INFLA	-.0414029	-.043929	.0025261	.0044759
TRADE	.0586563	.0544575	.0041987	.0046032

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\begin{aligned}
 \text{hi2}(9) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\
 &= 2.41 \\
 \text{Prob}>\chi^2 &= 0.9832
 \end{aligned}$$

Model 6

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
GE	9.234892	5.611293	3.623599	1.040411
DPuI	-.1847933	-.1463655	-.0384278	.0143944
DCPS	.0005252	.0001949	.0003303	.0002367
FDI	.1099624	.1097356	.0002268	.0046115
EXTDEBT	.7951957	.716142	.0790537	.1090915
GDP	3.233347	2.005095	1.228251	.5021092
DEBT SERVI	-.262819	-.2819875	.0191685	.0474781
INFLA	-.0360821	-.0421603	.0060782	.0035054
TRADE	.0619927	.054168	.0078247	.003963

Test: Ho: difference in coefficients not systematic

$$\begin{aligned}
 \chi^2(8) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\
 &= 17.42 \\
 \text{Prob}>\chi^2 &= 0.0261
 \end{aligned}$$

Model 7

b = consistent under Ho and Ha

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
INST	4.351274	2.810067	1.541207	.6229182
DPuI	-.186062	-.1547929	-.0312691	.0118891
DCPS	.0006971	.0002409	.0004562	.
FDI	.1167279	.1131263	.0036016	.0034049
EXTDEBT	.8631758	.8089163	.0542595	.0919392
GDP	2.536837	1.94286	.5939768	.492608
DEBT SERVIC	-.3794053	-.3345554	-.0448499	.0329773
INFLA	-.0432467	-.0454208	.0021741	.0014399
TRADE	.0645404	.0562561	.0082843	.003927

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\begin{aligned}\chi^2(9) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\ &= 13.56 \\ \text{Prob}>\chi^2 &= 0.1387\end{aligned}$$

Objective 2, Model 8

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
VA	4.493527	.955405	3.538122	1.000493
DPuI	-.1018597	-.0534612	-.0483986	.0236229
DCPS	.0022226	.0022894	-.0000668	.0003591
FDI	.0193537	.0079139	.0114398	.0079512
EXTDEBT	-1.015839	-1.362459	.3466198	.1746642
GDP	2.472682	.6097059	1.862976	.5491011
DEBT SERVIC	.5717322	.7376977	-.1659655	.0906727
INFLA	-.0426918	-.0549127	.012221	.005489
TRADE	.0276098	.0236085	.0040012	.0062103

Test: Ho: difference in coefficients not systematic

$$\begin{aligned}\chi^2(9) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\ &= 33.74 \\ \text{Prob}>\chi^2 &= 0.0001\end{aligned}$$

Model 9

b = consistent under Ho and Ha

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
CC	3.12374	.4307794	2.69296	1.133457
DPuI	-.1172989	-.0522998	-.064999	.0270127
DCPS	.0027213	.0024556	.0002657	.0003639
FDI	.0187674	.0078686	.0108989	.0082408
EXTDEBT	-.8489197	-1.315481	.4665612	.1905747
GDP	2.486993	.547365	1.939628	.57445
DEBT SERVI	.6979801	.7409688	-.0429887	.0835711
INFLA	-.0416847	-.0552071	.0135224	.0056802
TRADE	.0283801	.023285	.0050951	.0063423

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\chi^2(9) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 28.04$$

$$\text{Prob}>\chi^2 = 0.0009$$

Model 10

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\chi^2(9) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
RL	3.699707	.7002948	2.999412	1.212684
DPuI	-.1127186	-.0551479	-.0575707	.0251923
DCPS	.0029157	.0024817	.0004341	.0003622
FDI	.0186394	.0084669	.0101724	.0080332
EXTDEBT	-.961579	-1.316604	.3550253	.1774166
GDP	2.034146	.5248139	1.509332	.5394713
DEBT SERVI	.6900546	.7400998	-.0500452	.0817101
INFLA	-.0426408	-.0549068	.012266	.0055646
TRADE	.0312136	.0237362	.0074774	.0064524

$$= 27.47$$

$$\text{Prob}>\chi^2 = 0.0012$$

Model 11

b = consistent under Ho and Ha

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
RQ	-1.02278	-.6632506	-.3595294	1.195267
DPuI	-.0796233	-.0450865	-.0345368	.0242459
DCPS	.0028727	.0026222	.0002504	.0003589
FDI	.0149412	.0069087	.0080325	.0079524
EXTDEBT	-1.110463	-1.387268	.2768051	.1972129
GDP	2.135436	.7052114	1.430225	.5350398
DEBT SERVI	.7534348	.7334517	.0199831	.0774015
INFLA	-.0422614	-.0553453	.0130839	.0055845
TRADE	.0262532	.0240868	.0021663	.0064043

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\begin{aligned}\chi^2(9) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\ &= 20.55\end{aligned}$$

$$\text{Prob}>\chi^2 = 0.0148$$

Model 12

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\chi^2(9) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
PS	.4753592	.3189199	.1564393	.4055826
DPuI	-.084998	-.048242	-.036756	.0243351
DCPS	.0027206	.0023939	.0003266	.0003703
FDI	.0150729	.0069847	.0080882	.0082316
EXTDEBT	-.9643629	-1.2906	.3262373	.1876239
GDP	2.119238	.5371522	1.582086	.5519189
DEBT SERVI	.7691487	.7395623	.0295865	.0793275
INFLA	-.0416531	-.0550301	.013377	.0057344
TRADE	.0284578	.0235633	.0048944	.0066073

$$= 23.36$$

$$\text{Prob}>\chi^2 = 0.0054$$

Model 13

b = consistent under Ho and Ha

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
GE	3.211928	.2304893	2.981438	1.221162
DPuI	-.1174182	-.051786	-.0656323	.0267444
DCPS	.0028271	.0025201	.0003071	.0003617
FDI	.0168564	.0079517	.0089046	.0079834
EXTDEBT	-.9962783	-1.341822	.3455439	.178048
GDP	2.319732	.5604551	1.759277	.5483635
DEBT SERVI	.7491587	.7450503	.0041085	.0771189
INFLA	-.0402898	-.0546594	.0143696	.0055805
TRADE	.0298348	.0238019	.0060329	.0063701

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\begin{aligned}\chi^2(9) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\ &= 26.43 \\ \text{Prob}>\chi^2 &= 0.0017\end{aligned}$$

Model 14

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\chi^2(9) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
INST	2.189754	.4144834	1.77527	.7177551
DPuI	-.1127186	-.0551478	-.0575708	.0251923
DCPS	.0029157	.0024817	.0004341	.0003622
FDI	.0186394	.0084669	.0101724	.0080332
EXTDEBT	-.9615785	-1.316604	.3550259	.1774167
GDP	2.034146	.5248139	1.509332	.5394713
DEBT SERVI	.6900548	.7400999	-.050045	.0817101
INFLA	-.0426408	-.0549068	.012266	.0055646
TRADE	.0312136	.0237362	.0074774	.0064524

$$\begin{aligned}&= 27.47 \\ \text{Prob}>\chi^2 &= 0.0012\end{aligned}$$

Model 15, Objective 3

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
VA	3.670814	2.461705	1.20911	.921497
DPuI	-.1821864	-.1547854	-.027401	.0184694
DCPS	-.0003104	-.000424	.0001136	.0003191
FDI	.0636031	.0595925	.0040107	.0088498
VA_FDI	-.1193033	-.119974	.0006707	.0129609
EXTDEBT	.6704305	.6172397	.0531908	.1184414
GDP	3.176552	2.490557	.685995	.5263327
DEBT SERVI	-.4055052	-.3529838	-.0525215	.0670543
INFLA	-.036178	-.0382872	.0021092	.0042806
TRADE	.0558262	.0515817	.0042445	.0041953

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\begin{aligned}\chi^2(10) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\ &= 4.19\end{aligned}$$

$$\text{Prob}>\chi^2 = 0.9386$$

Model 16

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
CC	9.216754	5.837979	3.378775	.9955233
DPuI	-.1919494	-.1525558	-.0393936	.0151762
DCPS	-.0000188	-.0002243	.0002054	.0002634
FDI	.0303337	.0533172	-.0229835	.0129843
CC_FDI	-.1140401	-.0788516	-.0351884	.0142494
EXTDEBT	1.138344	.9586601	.1796839	.1232204
GDP	3.828248	2.381863	1.446384	.5541588
DEBT SERVI	-.4249005	-.3725257	-.0523748	.0522848
INFLA	-.0350052	-.0411997	.0061945	.0037744
TRADE	.0557447	.0492387	.006506	.0041381

Test: Ho: difference in coefficients not systematic

$$\begin{aligned}\chi^2(9) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\ &= 18.88\end{aligned}$$

$$\text{Prob}>\chi^2 = 0.0262$$

Model 17

b = consistent under Ho and Ha

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
RL	7.126027	4.378549	2.747478	1.058888
DPuI	-.1840441	-.1516676	-.0323765	.0122223
DCPS	.0007164	.0002721	.0004442	.000016
FDI	.1796165	.2139721	-.0343556	.0101497
RL_FDI	.0671278	.1075729	-.0404451	.0116922
EXTDEBT	.889565	.8520595	.0375055	.0929114
GDP	2.462847	1.848978	.6138687	.5042631
DEBT SERVI	-.3646701	-.3098811	-.054789	.033509
INFLA	-.0438433	-.0463958	.0025524	.0016143
TRADE	.0637907	.0552067	.008584	.0040518

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\begin{aligned}\chi^2(10) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\ &= 6.68\end{aligned}$$

$$\text{Prob}>\chi^2 = 0.7554$$

Model 18

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\chi^2(10) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
RQ	2.731566	1.09653	1.635036	1.141295
DPuI	-.139373	-.1250638	-.0143092	.0119622
RQ_FDI	.4864268	.5475534	-.0611266	.0182416
DCPS	-.0000451	-.0003184	.0002733	.0001399
FDI	.6181284	.6779432	-.0598148	.0184603
EXTDEBT	1.271162	1.130308	.1408539	.1360424
GDP	1.736835	1.255868	.4809667	.5225636
DEBT SERVI	-.118459	-.1108847	-.0075743	.042559
INFLA	-.0398149	-.0450189	.005204	.002799
TRADE	.0557232	.0490251	.0066981	.0044952

$$= 6.49$$

$$\text{Prob}>\chi^2 = 0.7729$$

Model 19

b = consistent under Ho and Ha

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
PS	.5833605	.605137	-.0217765	.3138095
DPuI	-.1421599	-.1269127	-.0152472	.0150529
PS_FDI	-.1858925	-.1975243	.0116318	.0120234
DCPS	.0005105	.0002848	.0002257	.0002921
FDI	.0277957	.0187769	.0090188	.0078946
EXTDEBT	.703249	.6417895	.0614595	.1315749
GDP	2.87966	2.353032	.5266281	.5362701
DEBT SERVI	-.2947044	-.2926632	-.0020412	.0564688
INFLA	-.0398326	-.0425891	.0027565	.0041088
TRADE	.0548385	.0501116	.0047269	.0046545

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\chi^2(10) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 5.09$$

$$\text{Prob}>\chi^2 = 0.8851$$

Model 20

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b-v_B)) S. E
GE	7.68645	4.011047	3.675403	1.074036
DPuI	-.1703467	-.1324391	-.0379077	.0145785
GE_FDI	.3226797	.39184	-.0691604	.0231321
DCPS	.0000659	-.0002805	.0003464	.0002519
FDI	.4949899	.57815	-.0831601	.0265136
EXTDEBT	.7975594	.7218232	.0757362	.1072659
GDP	3.109488	1.950395	1.159093	.4962692
DEBT SERVI	-.2288342	-.2374792	.008645	.0464442
INFLA	.0464442	-.0338276	.0047528	.0035305
TRADE	.0538715	.0457712	.0081003	.0042564

Test: Ho: difference in coefficients not systematic

$$\chi^2(9) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 17.48$$

$$\text{Prob}>\chi^2 = 0.0417$$

Model 21

b = consistent under Ho and Ha

Explanatory Variable	(b) Fixed effect	(B) Random Effect	(b-B) Difference	Sqrt(diag(v_b- v_B)) S. E
INST	4.217705	2.591541	1.626163	.6267275
DPuI	-.184044	-.1516675	-.0323766	.0122223
INST_FDI	.0397321	.0636704	-.0239384	.0069203
DCPS	.0007164	.0002721	.0004442	.000016
FDI	.1339098	.1407263	-.0068166	.0036353
EXTDEBT	.8895668	.8520608	.037506	.0929113
GDP	2.462844	1.848975	.6138686	.504263
DEBT SERVIC	-.3646696	-.3098805	-.0547891	.0335088
INFLA	-.0438433	-.0463958	.0025524	.0016143
TRADE	.0637906	.0552067	.008584	.0040518

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$hi2(10) = (b-B)'[(V_b-V_B)^{-1}](b-B)$

= 6.68

Prob>chi2 = 0.7553

Appendix D: Random Effects models

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
DPriI	-0.0535 (0.0380)	-0.0523 (0.0383)	-0.0551 (0.0384)	-0.0451 (0.0384)	-0.0482 (0.0378)	-0.0518 (0.0385)	-0.0551 (0.0384)
DCPS	0.00229 (0.00160)	0.00246 (0.00160)	0.00248 (0.00160)	0.00262 (0.00160)	0.00239 (0.00161)	0.00252 (0.00160)	0.00248 (0.00160)
FDI	0.00791 (0.0198)	0.00787 (0.0199)	0.00847 (0.0199)	0.00691 (0.0199)	0.00698 (0.0199)	0.00795 (0.0199)	0.00847 (0.0199)
EXDEBT	-1.362*** (0.385)	-1.315*** (0.389)	-1.317*** (0.387)	-1.387*** (0.389)	-1.291** (0.393)	-1.342*** (0.386)	-1.317*** (0.387)
GDP	0.610 (0.480)	0.547 (0.480)	0.525 (0.484)	0.705 (0.497)	0.537 (0.478)	0.560 (0.487)	0.525 (0.484)
DEBTSERV	0.738** (0.238)	0.741** (0.239)	0.740** (0.238)	0.733** (0.239)	0.740** (0.238)	0.745** (0.239)	0.740** (0.238)
INFLA	-0.0549** (0.0195)	-0.0552** (0.0196)	-0.0549** (0.0196)	-0.0553** (0.0196)	-0.0550** (0.0196)	-0.0547** (0.0196)	-0.0549** (0.0196)
TRADE	0.0236** (0.00886)	0.0233** (0.00887)	0.0237** (0.00886)	0.0241** (0.00887)	0.0236** (0.00880)	0.0238** (0.00888)	0.0237** (0.00886)
VA	0.955 (0.584)						
CC		0.431 (0.685)					
RL			0.700 (0.680)				
RQ				-0.663 (0.717)			
PS					0.319 (0.401)		
GE						0.230 (0.671)	
INST							0.414 (0.403)
Const.	8.738 (7.559)	8.901 (7.416)	9.640 (7.653)	6.064 (7.832)	8.409 (7.351)	8.928 (7.895)	9.163 (7.577)
N	336	336	336	336	336	336	336

DCPS = domestic credit to the private sector, FDI = foreign direct investment, EXDEBT = external DPriI =domestic private investment, DPuI = domestic public investment, DCPS = domestic credit to the private sector, FDI = foreign direct investment, EXDEBT = external debt, GDP = gross domestic product, INFLA = inflation, VA = voice and accountability, CC = control of corruption, RL= rule of law, RQ=regulatory quality, PS=political stability and absence of violence/ terrorism and INS = composite index of the institutional variables.

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Galah (2020).