PUBLIC PRIVATE PARTNERSHIP (PPP) IN INFRASTRUCTURE PROVISION: KEY DETERMINANTS FOR PRIVATE SECTOR ENGAGEMENT IN SUB-SAHARAN AFRICA (SSA)

By

Berkoh Alfred Nuako Kwame

THESIS

Submitted to

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ABSTRACT

The overall significance of infrastructure to sustainable development cannot be overemphasized and thus continues to remain a critical component for development. While the issues of globalization and urbanization continue to emphasize the need to expand existing infrastructure, budgetary constraints amongst other factors have also increased the need for alternative source of funding to meet the infrastructure gap. Particularly for the Sub-Saharan Africa (SSA), the infrastructure gap continues to remain a significant restraint to its development. Consequently, Public Private Partnership (PPP) has evolved as an alternative financing tool and a growing trend for infrastructure financing yet remains an underdeveloped paradigm in the SSA region.

This report thus analyses the key determinants for private sector engagement in PPP in Sub-Saharan Africa with critical emphasis on the macroeconomic situation, favorable market conditions, governance and political climate as well as the regulatory and institutional environment as key determinants. This study uses a cross-country panel data using random effects regression with the outcome variable being the total amount of investment on private participation for infrastructure (logged) from 2005 to 2014.

As expected, the study revealed that the favorable market conditions, using population size and the GDP per capita as proxies, as well as the quality institutions for effective and efficient service delivery are the most significant determinant of PPP investments for the SSA region. However, in contrast to the assumption of the study, aid and higher regulatory burden those were not anticipated to positively impact PPP investments rather significantly influenced PPP investments in the region.

In line with these findings, it is recommended that policies that significantly improve the market conditions should be designed and formulated while building on

institutional capacity and experience to implement PPP related policies and programs. Also, policy makers as well as international and regional agencies should design policies that will seek to advance long term PPP investments in an adequately regulated business environment as well as provide guarantees and other risk management mechanism to foster private sector investments amidst the weak regulatory environment that may exist.

Although the model specifications is preliminary, we believe the findings and discussions herewith significantly contribute to existing literature particularly considering the fact that very limited studies have been conducted on the SSA region on the subject matter.

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ABBREVIATIONS

EIU	Economic Intelligence Unit
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GLS	Generalized Least Square
ICRG	International Country Risk Guide
ICT	Information and Communication Technology
IEF	Index of Economic Freedom
IRR	Internal Rate of Return
LMICs	Low and Middle Income Countries
OECD	Organization for Economic Co- operation and Development
OLS	Ordinary Least Square
PPI	Private Partnership in Infrastructure
PPP	Public-Private Partnership
PPPI	Public-Private Partnership in Infrastructure
SSA	Sub-Saharan Africa
WDI	World Development Indicators
WGI	World Governance Indicators

INTRODUCTION

The overall significance of infrastructure to livelihood is undebatable such that, it has become a significant component for promoting and sustaining growth and development across all regions (Calderón & Servén, 2010). With globalization and trends of urbanization increasing, the demand for adequate infrastructure to promote development and sustain livelihood is rising (Flores, 2013). Globally, governments have been faced with the challenge of providing adequate infrastructure in terms of quantity and quality. This situation is rather prevailing in developing economies and emerging markets that are particularly constrained with financing these infrastructure from traditional government finances using the annual budgets. Consequently, Public-Private Partnership (PPP) evolved and became a preferred mode for delivering public infrastructure projects to achieve value for money (Gunnigan & Rajput, 2010).

Public-Private Partnership (PPP) is defined as a risk sharing and long-term contract agreement between a public and a private entity for the delivery of public goods and services with remuneration linked with performance (Maria et al, 2015). With PPP as a tool for infrastructure financing, a mechanism has been provided to better harness the strengths and exploit the benefits of the comparative advantaged for the public and private sectors of the economy (Jamali, 2004). Through these PPP arrangements, all actors are able to realize the partnership goals, especially, infrastructure development.

Despite the success of PPP as an alternative financing tool for effective infrastructure provision, most developing countries are yet to attract the needed private partners in infrastructure provision. The SSA region continues to experience high poverty rates, making it the poorest region in the world (World Bank, 2017). Besides, although PPP is a widely adopted financing tool, it continues to remain as an evolving paradigm in

Sub-Saharan Africa primarily due to prevailing barriers against its successful implementation. At the moment, PPP projects have been concentrated in only a few countries such that, about 48% of the total infrastructure projects financed through PPP in the sub-region has been concentrated in Nigeria, Uganda, Kenya and South Africa alone over the past 25 years (World Bank, 2017).

Recently, the World Bank (2017) has suggested that PPP will play a significant role if the SSA region will pick up from the sharp decline of growth in 2016 for a more inclusive growth within the medium term. The World Bank argued that the SSA region has a potential to increase its GDP per capita by 2.6 percentage point by closing the infrastructure gap relative to the global best performers (World Bank, 2017) but that will require increased investment in infrastructure. There is therefore the need to determine the enabling factors for effective partnership in the successful implementation of PPP in infrastructure provision.

Globally, the viability of PPP in the provision of infrastructure has been determined by a number of studies conducted with varied characteristics across various countries (Xie & Stough, 2002). However, very few of these studies have looked at the determinants for successful partnership and private sector investment in PPP ventures in infrastructure provision (Hammami et al, 2006). More specifically, the author sited a single study that tried to identify the determinants for PPP in infrastructure provision for Sub-Saharan Africa and the data used spanned from 1990 to 2008 (Mengistu, 2013). This study will therefore extend the time period up to 2014 and explore which key factors have influenced PPP investment in the SSA region.

While Jamali (2004) has established that the determinants of PPP include government commitment, a sound regulatory framework and equitable allocation of risks,

Cheung et al., (2012) and Mengistu (2013) have further established that fulfillment of key formation requirements, favorable market, and macroeconomic conditions define the level of private sector investment in PPP. Accordingly, it is hypothesized that PPP investment will be higher in countries with high debt and deficit; lower inflation and stable exchange rates; politically stable and accountable governments; as well as a well-structured institutional and regulatory framework.

This paper seeks to identify the determinants of private sector investment in PPP for infrastructure provision in Sub-Saharan Africa (SSA). The determinants are important because private sector engagements in PPP continue to remain low in the sub-region in spite of the growing demand underpinned by rapid population growth coupled with the increasing budgetary constraints in financing the provision of these infrastructure projects from governments' traditional financing sources. PPP has thus, become an important financing tool in reducing infrastructure gap in the sub-region. The findings of this research will be of interest to policy makers across the SSA region seeking to identify alternative financing tools for adequate infrastructure. Also, this study may be of use to private sector entities that are interested in project financing in SSA as well as the academia, seeking to broaden the knowledge available on the subject matter.

The study will entail a thorough review of literature on PPP while detailing, the various determinants for private sector participation in PPP ventures in SSA region. Subsequently, the hypotheses to be tested and the methodology to be adopted with the data sets to be used for the study will be examined. Finally, the study will conclude with the discussion of results and findings along with the implications for policy formulation and future studies.

LITERATURE REVIEW

2.1 Infrastructure and Development

According to Prudhomme (2004) infrastructure can be described as capital goods that are consumed together with labour and other inputs to provide public services. They include transport (roads, bridges, rails, ports and airports), energy (power distribution and generation), water (water treatment and sewerage disposal), and social infrastructure (schools, housing, hospitals and prisons) (Saravanan, 2008). Infrastructure has been widely accepted as fundamental to growth and development (Briceno-Garmendia, 2004). While the findings of Mamatzakis (2008) confirmed the role of infrastructure to the economic development of Greece, Mentolio and Sole-Olle (2009) further reiterated by affirming the role of investment in roads in increasing the productivity of labour in the Spanish regions. More recently, the role of infrastructure in development has been heightened in the global development agenda, specifically towards the achievement of the Sustainable Development Goals (United Nations [UN], 2015).

However, there is a growing concern in financing infrastructure gap for development. For instance, the World Bank (2012) indicated that an estimated investment of US$1 trillion is needed to finance the infrastructure gap in low and middle-income countries. Similarly, a total investment of US$93 billion is estimated by the World Bank to finance the infrastructure gap in the Sub-Saharan Africa (SSA) region alone (Gutman, Sy, & Chattopadhyay, 2015). Consequently, there is the growing advocacy for increased private sector involvement towards closing the infrastructure gap to meet the growing demand.

2.2 Public-Private Partnership (PPP) and Infrastructure

Primarily, governments all over the world had assumed full responsibility in the provision of infrastructure. However, with the increasing budgetary constraints coupled with the growing issues of globalization and macroeconomic volatility, financing infrastructure became more challenging (Saravanan, 2008). Private participation in infrastructure has therefore evolved and grown in significance to become an inevitable phenomenon in eliminating the infrastructure gap, especially in developing and emerging economies.

The concept PPP has been existent since the late 19th century. According to Hammami, et al (2006), the concept of PPP was introduced in the late 1960s through the works of Leibenstein (1966) and simulated by the United Kingdom in the 1980s through the introduction of the Private Finance Initiative (PFI) as a PPP. This heightened the attractiveness of PPPs and has since developed to provide alternative means to infrastructure.

PPP has been defined and conceptualized differently by different people. While some people have perceived PPPs as a derivative of privatization (Savas, 2000), others have conceptualized PPP as a mid-path between public sector capitalism and privatization (Linder, 1999; Leitch and Motion, 2003). On the other hand, Pongsiri (2002) has argued that the concept of PPP goes beyond this notion of privatization to include a distinct contractual arrangement governed within a regulatory framework. Similarly, Bogado (2015) and Hodge and Greve (2007) have argued that PPPs entail well-defined underpinnings characterized by specific goal and clear assignment of responsibility as well as risks that govern the public and the private sector engagement. However, for the purpose of this study, PPP is defined as *a risk sharing long-term contractual arrangement*

between a public and a private entity for the provision of public goods and services in which remuneration is linked with performance (Bogado, 2015; International Bank for Reconstruction and Development, World Bank, Asian Development Bank, 2014).

According to the World Bank (2016) as of December 2015, private sector activity in infrastructure provision across the various infrastructure sectors – energy, transport, information and communication technology, and water and sewerage - stood at 6,977 projects, of which the Latin America and the Caribbean region constituted 31% (2,196 project), and the East Asia and the Pacific region constituted 29% (2005 project). On the other hand, the Sub-Saharan Africa region constituted 8% (549 projects) of the total number of projects while the South Asia, and the Europe and Central Asia regions constituted 17% (1,160 projects) and 13% (890 projects) respectively (World Bank, 2016). Accordingly, private sector participation in Sub-Saharan Africa for the provision of infrastructure in the region can be concluded to be lower, implying there is room for improvement. The question therefore is, what are the determinants for private sector engagement in PPP in infrastructure in the SSA region?

2.3 Determinants of Public-Private Partnership in Infrastructure

It is evident that PPP establishes a formalized relationship and interaction between the public and private actors in the achievement of specified goals. With this relationship comes a varied interest for each party, coupled with the comparative advantage that is harmonized towards achieving efficiency and effectiveness in service delivery. The public sector is driven by the need to improve its efficiency in program performance through better service delivery. This is underpinned by lower cost and risk for the public purse while providing the favorable business environment for the effective functioning of

the private sector (Leitch and Motion, 2003; Pongsiri, 2002). Furthermore, the private sector is interested in maximizing its investment potentials through increased profits and better business opportunities (Scharle, 2002). Therefore, the roles of the public and the private sectors are complementary - which under the right conditions and appropriate structuring - in harnessing the strengths, resources and expertise towards the achieving of both sector goals. To this end, a favorable macroeconomic environment is critical for the proper functioning and the formation of PPPs.

Grimsey and Lewis (2002), supported by Bogado (2015) have also established that infrastructure provision is associated with different types of risks and these are fundamental to the structuring as well as the success or otherwise of PPP formation in infrastructure provision. Among these risks identified are the project default; financial; operating; and political and legal risks. Besides that, the infrastructure sector has been identified to have monopolistic features that will require a sound institutional and regulatory environment to propel its success (Grimsey & Lewis, 2002; Kirkpatrick et al. 2006). Therefore, the market situation, institutional and legal framework, as well as the governance and political climate are essential factors that will determine private sector investment ability in any given region.

Various studies – both qualitative and quantitative - have been conducted to establish the determinants for private sector engagement in PPP in infrastructure (PPPI). Hemmami et al. (2006) considered the major incentives and constraints in PPPs arrangements and identified that: (1) government constraints, (2) political environment (3) institutional quality and legal system, (4) past experience, and (5) private participation, are major areas for determinants of PPP engagements. Similarly, Bogado (2015) identified legal; public sector efficiency; political; financial obligation

compliance; macroeconomic stability; and market stability, as major channels for determining increased engagement in PPPs in Latin America and the Caribbean region. Additionally, the only study that considered the determinants for PPP with somewhat emphasis on the Sub-Saharan Africa (SSA) region identified three (3) broad channels namely (1) government motivation, (2) private firm motivation and (3) enabling environment for increased PPPs in LMICs and SSA (Mengistu, 2013). Given these diverse categories of determinants identified, it is necessary to synchronize the varied categories identified for effective analysis.

Based on literature reviewed above, this study categorizes the determinants for private sector engagements in PPP into four broad areas namely (1) macroeconomic situations, (2) favorable market conditions, (3) governance and political climate, and (4) institutional quality and regulatory system. Also, it is worth adding that Public-Private Partnership in Infrastructure (PPPI) and Private Partnership in Infrastructure (PPI) are two terminologies that have been used interchangeably in several studies (Park, 2013). Similarly, this study will use these terminologies interchangeably to denote private sector participation in infrastructure provision.

2.4 Conceptual Framework and Hypotheses

This section seeks to identify the key factors influence private sector engagement in Public-Private Partnership in infrastructure in Sub-Saharan African (SSA) structured along the categorization for the study and these are macroeconomic situations, favorable market conditions, governance and political climate, and institutional quality and regulatory system.

2.4.1 Macroeconomic Conditions

It is common knowledge that stable macroeconomic conditions with minimal risk to external shocks as well as fiscal credibility in the implementation of economic policies encourage private investment. According to (Bogado, 2015), and (Zhang, 2005), a favorable investment environment underpinned by economic viability is critical to promoting macroeconomic stability and attracting private sector investment for infrastructure development. Available literature has established stable inflation as a common feature of macroeconomic stability. As such, unstable inflation rate (Banerjee, Oetzel, & Ranganathan, 2006; Hammami et al., 2006) as well as fluctuating exchange rate (Hammami et al., 2006) can affect private sector profitability considering the fact that private sector investments are mostly in foreign denominated currency. This suggests that a stable inflation and exchange rate will foster private investment in infrastructure. From these arguments, the following hypothesis is derived:

Hypothesis 1: PPP will be lower in countries with higher inflation rate and fluctuating exchange rates.

On the other hand, a study conducted by Harris (2003) supported by Mengistu (2013) established that countries that were constrained with budget burdens to finance their infrastructure provision to meet their demand were more poised to attract private investment. On the other hand, Glaser (2001) established that governments with access to external funds such as aid have had milder economic crisis and as such, were less motivated to attract PPI. This tends to suggest that the ability to self-finance infrastructure will sway the motivation to engage in PPPs. Therefore, it is hypothesized as follows:

Hypothesis 2: PPP will be lower in countries with adequate revenue and external funds such as aid

2.4.2 Favorable Market Conditions

According to Hammami et al. (2006) and Asiedu (2002), market oriented policies foster foreign direct investment and as such, governments that observe such policies are more likely to attract more PPI. Nonetheless, infrastructure projects, by their nature, are capital intensive such that, they require large-sum initial investment to finance their provision. For that much, the revenue streams (Grimsey & Lewis, 2002), and the Internal Rate of Return (IRR) on the investment (Jasiukevičius & Vasiliauskaitė, 2014) are prerequisite for investors prior to the formation of PPPs. As such, the user ability to pay is examined during the risk profiling in determining the potential profitability of a PPP venture (Lamech & Saeed, 2003). This suggests that larger market with prospects of profitability coupled with consumer's high purchasing power will affect PPI engagement. Therefore, it is hypothesized as follows:

Hypothesis 3: PPP will be higher in countries with higher demand and higher purchasing power

2.4.3 Governance and Political Climate

Available literature has established that one major factor that is considered prior to investor decision in any given country is the political and government climate in that region (Foster & Briceño-Garmendia, 2010; Singh & Kalidindi, 2014). Similarly, Himmami et al. (2006) has established that there are ethical fractions – particularly dominant in SSA - that are characterized by diverse infrastructure needs within governments thereby resulting in high infrastructure demand. To this end, accountable and politically stable governments are required to attract and safeguard private investment

towards addressing these infrastructure needs. This argument leads us to hypothesize as follows:

Hypothesis 4: PPP will be higher in countries with a stable political and accountable system

2.4.4 Institutional Quality and Regulatory System

PPPs, by their nature are contract-based arrangements between the private and the public sectors. However, considering the various issues that characterize the relationship between these sectors, a legal and regulatory framework is, thus, essential to protect and guarantee the interest of the actors (Jamali, 2004). While the findings from Mengistu (2013) have suggested that lower government efficiencies and higher regulatory burden have increased PPP investments in the SSA region, Lamech and Saeed (2003) as well as Hammami et al. (2006) have suggested that a well-regulated legal environment and institutional framework that is free from political interference will define the investor roles and responsibilities while protecting the property rights and will, thus, promote private investment. Such well-regulated and institutional frameworks will thus guarantee a well-controlled environment to promote investment opportunities.

On the other hand, Pistor, Raiser, and Gelfer (2000) have established that beyond the impact of the laws is the need for effective institutions to promote accountability and uphold the implementation of regulations. Therefore, regulatory and institutional framework is fundamental to shaping and attracting PPIs and the following hypothesis is the derived:

Hypothesis 5: PPP will be higher in countries with well-structured and administered institutions, and regulatory framework for the business environment.

DATA DESCRIPTION AND METHODOLOGY

3.1 Description of the Private Participation in Infrastructure (PPI) Database

The PPI Database is a multi-sectoral data set maintained by the World Bank Group on private sector investment in infrastructure. The database is the most widely used and available standardized database that comprehensively captures project level details on PPI in infrastructure among Low and Middle Income Countries (LMICs). The PPI Database has compiled large infrastructure projects that have reached financial closure from 1983 to 2016; assessed from 138 Low and Middle Income Countries (LMICs) in the world categorized into the six (6) World Bank regional classification namely: (1) East Asia and the Pacific, (2) Europe and Central Asia, (3) Latin America and the Caribbean, (4) the Middle East and North Africa, (5) South Asia, and (6) Sub-Saharan Africa (World Bank, n.d.). Additionally, the database captures information along four (4) broad sectors as follows:

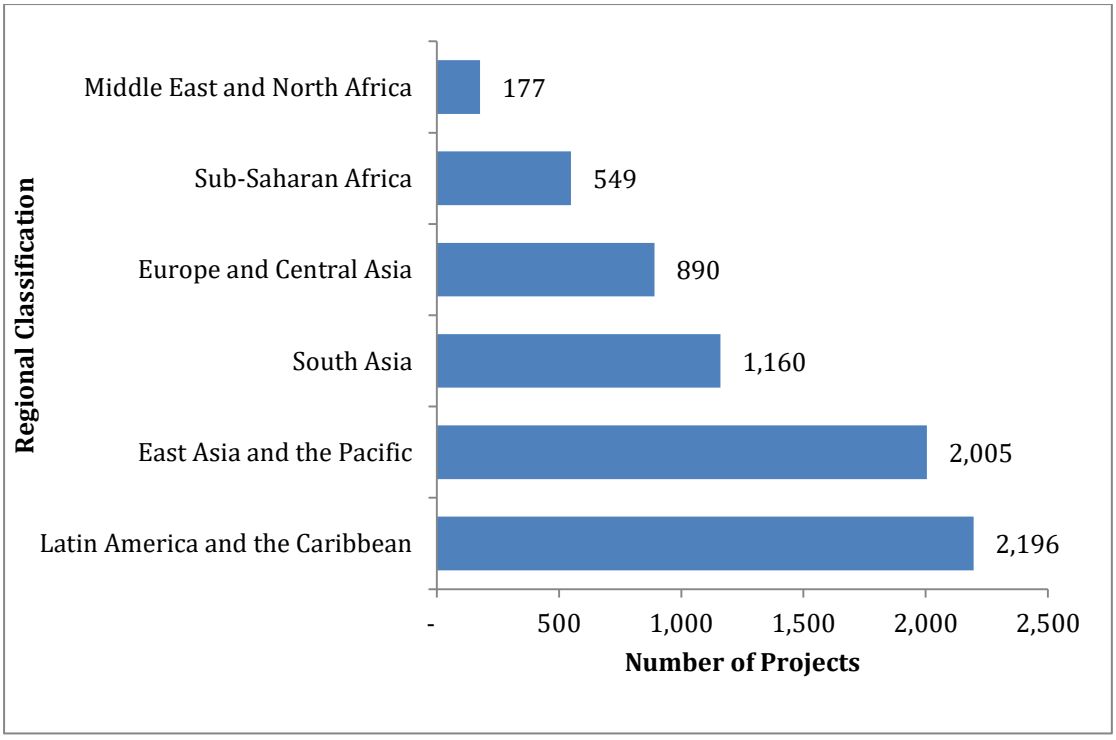
1. Energy (Electricity generation, transmission, and distribution; and natural gas transmission and distribution)
2. Information and communications technology
3. Transport (airport; railways; toll roads, bridges, highways, and tunnels; port infrastructure, superstructures, terminals, and channels)
4. Water (potable water generation and distribution; and sewerage collection and treatment)

However, this dataset is not devoid of limitation considering the fact that, it captures only large infrastructure project sourced from public sources and as such, there is a huge potential for exclusion of information on small sized PPIs, especially at

the local government level. That notwithstanding, this database remains the most credible and widely used information source for PPIs in developing countries.

As at 2015, a total of 6,977 projects had been captured in the database with the Latin America and the Caribbean Region accounting for the majority of the projects (31.5%) at a total cost of US$10.15 billion while the Middle East and North Africa region accounted for the least number of projects (2.5%) at a cost of US$10 million. The East Asia and the Pacific was the second largest region with the most projects (28.7%) at a cost of US$1.95 billion with the Sub-Saharan Africa region accounted for 7.9% projects at a cost of US$40 million (World Bank, n.d.). This clearly suggests that the ability of the various regions to attract private sector investments for infrastructure provision is different. Figure 1 below shows the detailed total number of projects by regional classification.

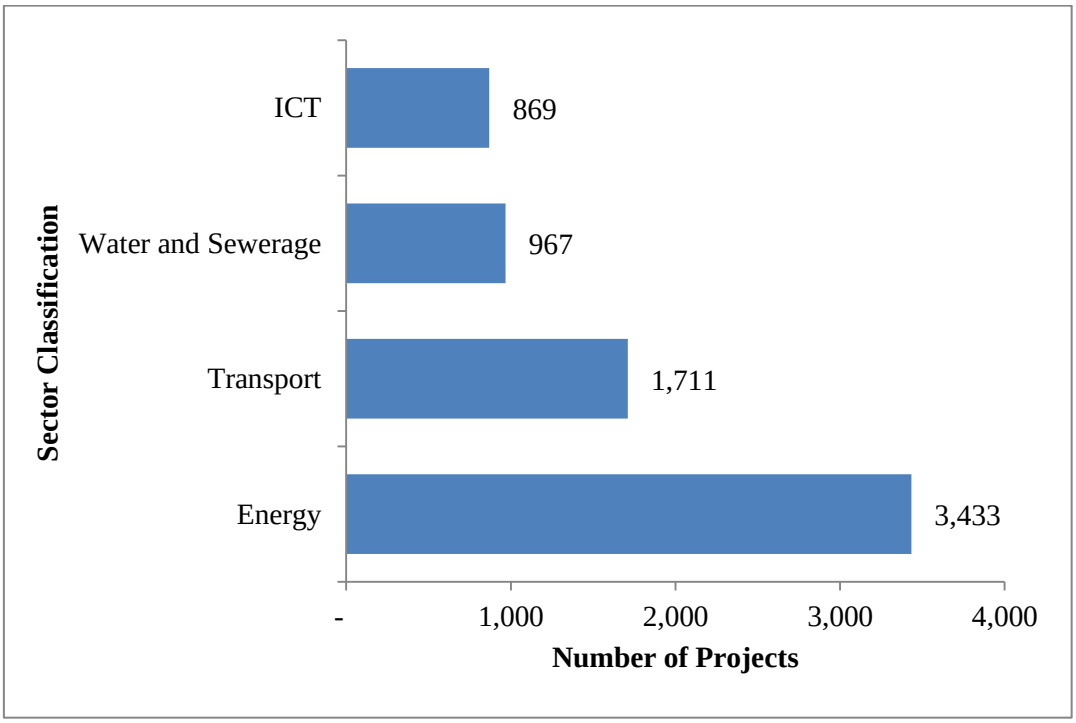
Figure 1: Total Number of Projects By Regional Classification



Source: World Bank, n.d.

Also, the data set revealed that the investment amount and the total number of projects by sector classification is varied comparatively. As at December 2015, the energy and transportation sectors were the most vibrant sectors for private sector investment considering the fact that they attracted a total of 3,433 projects (representing 49.18%) and 1,711 projects (representing 24.51%) respectively (World Bank, n.d.). This tends to suggest the overall importance of energy sector, and for that much energy infrastructure to developing countries. Figure 2 below shows the total number of projects by sector Classification.

Figure 2: Total Number of Projects By Sector Classification

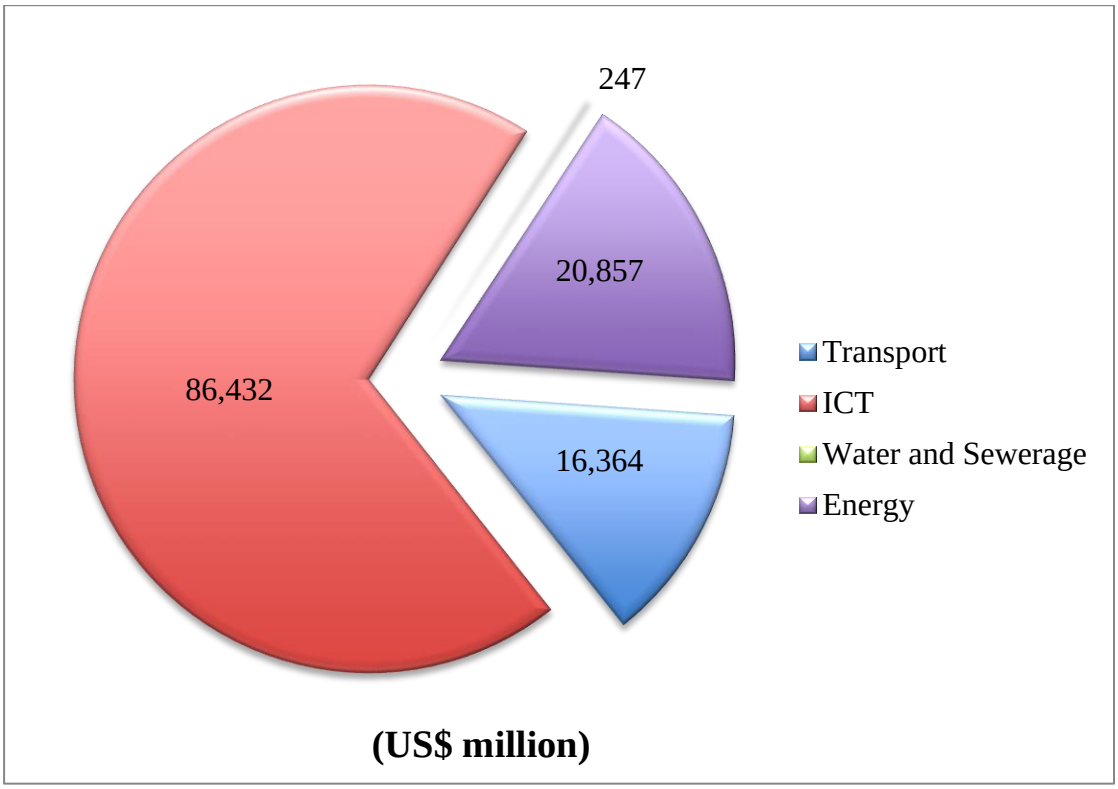


Source: World Bank, n.d.

Specifically for the period under review, the total investment to the Sub-Saharan African region amounted to US$123.9 billion, which translated into a total of 254 projects. Of this investment, the Information and Communication Technology

(ICT) sub-sector contributed the largest (69.76%) amounting to US$ 86.43 billion while the water and sewerage sub-sector accounted for the least (0.20%) amounting to US$247 million. The Energy sub-sector received the second largest investment to a tune of US$20.86 billion (representing 16.83%) while the transport sector received a total investment of US$16.36 billion (representing a total of 13.21%). This therefore establishes a monotonous investment pattern which is rather skewed towards the ICT sub-sector accounting for approximately 70 percent of the total investments to the SSA region during the period under review. Figure 3 below shows the investment distribution to the SSA region from 2005 to 2014.

Figure 3: Total PPP Investment to Sub-Saharan Africa from 2005 to 2014



Source: World Bank, n.d.

3.2 Study Sample

This study is centered on Public Private Partnership (PPP) investments to the Sub-Saharan Africa region from the period 2005 to 2014. The available comprehensive database on PPIs has significant missing values for 2015 and 2016 financial years. As such, the main reason why this study was limited to the total investment in PPP for the period 2005 to 2014 to facilitate the efforts at making significant contribution without the impact of the missing values.

Additionally, a total of thirty-six (36) out of the forty-eight (48) Sub-Saharan Africa countries are used for the data analysis due to missing values for eleven (11) countries and the overly extreme situation in the case of Zimbabwe with relation to its inflation rate, which is a variable, considered for the study. This is believed to have the tendency to sway the result of the study and limit the ability to generalize the outcome of the study. The countries excluded from the study therefore are include Burundi, Comoros, Equatorial Guinea, Eritrea, Ethiopia, the Gambia, Namibia, Sao Tome and Principe, Seychelles, Somalia, South Sudan and Zimbabwe.

3.3 Description of Explanatory Variables

This section details out the various data sets to be used in testing the relationship between the variable as have been hypothesized above. Appendix 1 attached summarizes the Independent variables to be used in explaining and testing the hypothesis as well as the data source and expected effect.

In assessing the macroeconomic conditions of the various countries, the inflation rate, exchange rate stability as well as the current account balance and the aid disbursement per capita is used. For the rate of inflation, the annual inflation rate measured by the consumer price index from the World Banks WDI database which

reflects the annual percentage change in the cost of acquiring a basket of goods and services in a year, is used with the rational that, inflation generally affects the cost of living and doing business in any economy. As such, private sector investments (PPIs) are likely to be lower in countries with high inflation rates and for that much, a negative effect is expected.

Also, the exchange rate stability index from the International Country Risk Guide (ICRG) country database measures the level of appreciation or depreciation of a currency against the US dollar over a calendar year. The exchange rate stability index is measured from a scale of 0 to 10 with the highest signifying a low risk and relatively stable exchange rate. However, this index is inverted to a scale of 0 to 10 with the highest signifying a high risk and unstable exchange rate for the purpose of this study. For that much, it is expected that a highly unstable exchange rate will negatively affect the level of PPI's in any given economy. Therefore negative relationship is anticipated.

On the other hand, OECD database on aid disbursement to the sub-Saharan Africa region and total population from the World Bank WDI is used to determine the net aid per capita to the respective countries as a means to suggest that countries with higher aid per capita are less constrained in financing their infrastructure projects and thus, PPP will be lower in countries with access to external financing, specifically aid. Also, the current account balance (as a % share of the GDP) from the World Bank WDI Database is used to assess the macroeconomic situation of the various countries. This variable measures the sum of net exports of goods and services, net primary income, and net secondary income. It is expected that countries that have high positive current account balance will be less motivated to engage in PPP and thus, low PPI's. Therefore an inverse relationship is anticipated.

Data for the favorable market conditions is depicted with the population size (set in logarithm) and the real GDP per capita based on purchasing power parity (set in logarithm) assessed from the World Bank WDI Database. The purchasing power parity GDP used is the gross domestic product converted to international dollars using purchasing power parity rates. These variables will be used with the notion that reducing commercial risks associated with investment is part of the critical factors that inform private sector investment and a feasible means to better predict the market demand and willingness to pay on the part of facility users. Therefore, PPP is expected to be high, when the population and the GDP per capita for purchasing power are high thereby depicting an expected positive relationship.

As a proxy for governance and political climate, the International Country Risk Guide (ICRG) country data on government stability as well as law and order is used. The government stability index which is a grouped variable, made up of three sub components of four points each (totaling 12 points) - government unity, legislative strength and popular support – assesses the ability for government to carry out its declared programs and its ability to stay into office. The law and order index on the other hand, measured from 1 to 6 assesses the strength and impartiality of the legal system as well as the observance of law. In both instances, the higher values represent low risk and much favorable environment for business to thrive. Since the political and governance system determines the consistency of government programs and plays significant roles in the attractiveness of an economy to the private investment, private investors are more likely to commit their resources to investing in countries that have politically stable and accountable government. For that much, a positive relationship is anticipated in both cases.

The business freedom index from the Heritage Foundation Index of Economic Freedom (IEF) is used to assess the institutional and regulatory framework for the countries. This assesses the extent to which the regulatory environment constrains the effective operation of businesses. Here, the higher the better meaning the higher the index the freest of business regulatory environment and as such, a positive relationship is anticipated between business freedom index and the level of PPI in the region.

Additionally, the bureaucracy quality index from the ICRG country database which measures the strength of institutions with much greater emphasis on sustainability of government policies and the ability for the institutions to function with autonomy is also used to determine the quality of institutions in the various countries. The bureaucratic quality is assessed using a 4-point scale. Here, the higher the index rating, the stronger and much effective the institutions to function and foster the environments for private business to thrive. For that much, a positive correlation is anticipated between the explanatory variable on institutional quality and the dependent variable - PPI.

3.4 Methodology

A Panel Data Analysis is used to cater for the two dimensional data (cross-sectional and longitudinal) considered for the study. Here, the total Private Sector Investment, measured in million United States Dollars (US$' million) was used as the dependent variable. However, PPP's by their nature take some time before they actually achieve financial closure and as such, the fact that there is no investment in a specified year does not mean the absence of PPP activities as a whole in the specified country. For that much, and in line with previous studies (Mengistu, 2013) the natural

logarithm transformation of the PPI investment (thus, ln [PPI +1]) is used in order to mitigate the effect of having a left skewed distribution as a result of the significant number of observations being zero.

Also, it is worth mentioning that the panel data being used presents a tendency for autocorrelation and heteroskadasticity within the model with relation to the standard errors. This study therefore utilized the Generalized Least Square (GLS) model in line with Hammami et al (2006) to estimate the relationship between the dependent and the independent variable. However, it is worth adding that some previous studies have utilized Ordinary Least Square (OLS) model and Tobit Regression Model (Bogado, 2015; Mengistu, 2013).

Also, a hausman test was conducted to determine whether a fixed effect model or random effect model is most preferred for the study. The null hypothesis for the study assumed that the estimated coefficient by the random effect model would be same as the ones estimated by the fixed effect. Nonetheless, the test result implies that the null hypothesis cannot be rejected therefore the random effect model is used for the study (p=0.0647). Appendix 2 attached shows the results of the hausman test.

Additionally, the four categories of determinants as specified earlier in this paper is utilized such that *W* represents the variables for macroeconomic situation, X represents the variables for favorable market conditions, *Y* represents the variables for governance and political climate and *Z* represent the variables for institutional quality and regulatory system. The regression model utilized for the study is therefore specified as:

$$\textbf{Model: } \ln(PPI+1) = \beta_0 + \beta_1 W_{it} + \beta_2 X_{it} + \beta_3 Y_{it} + \beta_4 Z_{it} + \varepsilon_{it}$$

Where:

ln(PPI+1): *Total Investment in PPP + 1 (log)*

W: *variables for macroeconomic situation (Inflation; Exchange Rate Stability; Net Aid Per Capita; Current Account Balance)*

X: *variables for favorable market conditions (Population [log]; GDP Per Capita [log])*

Y: *variables for governance and political climate (Law and order; Government Stability)*

Z: *variables for institutional quality and regulatory system (Business Freedom; Bureaucratic Quality)*

ε: *Random error component*

Further, a robustness check is conducted using some alternative specification to check and estimate the robustness of the results. First, we introduced different explanatory variables in place of the business freedom index, which is a perception-based measure to ensure that the result is not biased.

Also, the regression was conducted without South Africa to ascertain the robustness of the result. This is motivated by recent publication by the Economic Intelligence Unit (EIU) that sought to evaluate the environment for PPP in Africa. The findings of this study indicated that South Africa was the only country in Africa with a well-developed environment for PPP based on the infrascope indicators used for the study; as such, South Africa is a potential outlier in driving the results of the study (Economist Intelligence Unit, 2015).

Also, considering the fact that a number of previous studies have used different regressions, the robustness check adopted tries to compare three of the most commonly used regressions. For that much, the Random Effect GLS model, which is the benchmark model, was compared with that of the OLS Regression and Fixed Effect model.

RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Table 1 below summarizes the descriptive statistics for the key determinants that influence private sector participation in PPP for infrastructure provision in Sub-Saharan Africa (SSA). With reference to the variables for macroeconomic situation, it can be deduced from the table that on average, the Sub-Saharan African countries have a relatively low mean inflation (7.26%) and relatively high mean exchange rate stability index score (6.70). Similarly, the mean aid per capita is above average (3.97) while on the other hand, the current account balance accounts for -6.10% share of the GDP. Nonetheless, these variables predispose uneven distribution across the region with high standard deviation during the period under review (2005-2014).

Table 1:Descriptive Statistics

Variable	Obs	Mean	Std. Dev	Min	Max
Inflation (% annual)	360	7.26	6.68	-35.84	37.39
Exchange Rate Stability	360	6.70	4.17	0	10
Ln Aid Per Capita	360	3.97	0.75	1.61	6.48
Current Account Balance (% of GDP)	360	-6.10	11.14	-80.05	32.54
Ln Population (number)	360	7.00	0.56	5.68	8.25
Ln GDP Per Capita	360	6.94	0.98	5.13	9.28
Law and Order (index number)	360	2.08	1.38	0	5
Government Stability (index number)	360	6.22	3.83	0	11
Business Freedom (index number)	360	50.85	17.53	0	85
Bureaucratic Quality (index number)	360	0.85	0.82	0	2.5

Additionally, the favorable market conditions as demonstrated by the population size and the GDP per capita are equally high with an approximated mean population size of 20,180,469 people and a mean GDP per Capita of US$3,662.07. Nonetheless, it is worth mentioning that in both cases, the distribution was relatively uneven. The population distribution ranged from as low as 480,795 people in the case of Cabo Verde to a high distribution of about 176,460,502 people in the case of Nigeria. Similarly, the GDP per capita on average, ranged from as low as US$ 532.35 in the case of Liberia to as high as US$ 19,230.66 in the case of Mauritius.

In the case of the governance index, it can be deduced that the SSA region on average ranked poorly in the area of law and order as characterized by the low mean index score of 2.08 over the period under review. On the other hand, the region has a relatively stable government as depicted by the relatively high mean index score of 6.22. Similarly, values for institutional and regulatory index for the SSA region for the period under review all recorded low mean values of 50.85 and 0.85 respectively as shown in Table 1 above.

4.2 Determinants of PPP Investments in SSA

This section presents the regression results in determining the relationship and influence between the factors identified and PPP investments in SSA countries for the period under review. Table 2 below summarizes the results herewith discussed. Overall, the findings indicate that population size and purchasing power, assessed by the GDP per capita, as well as the institutional quality, measured by the bureaucratic quality index are significantly associated with higher PPP investments. Also, other findings suggest that aid and business regulatory environment are somewhat related to PPP investments in the SSA region.

Table 2: Determinants of PPP Investment

Dep. Variable: Amount of PPI Investment (ln(PPI+1); Random - GLS		
Variables	**Coefficients**	**Rob. St. Error**
Inf	-0.0311	0.0201
Exrate	-0.00866	0.0593
ln_naidpc	**0.521****	0.286
CA_Bal	-0.00599	0.186
ln_pop	**2.255*****	0.247
ln_gdppc	**0.389****	0.0187
L_order	0.103	0.16
G_Stability	0.0223	0.0572
B_Fdom	**-0.0158***	0.00925
B_Qty	**0.400***	0.179
Constant	-13.14***	3.011
No. of Observations	360	
No. of Countries	36	
No. of Years	10	
R-squared	0.223	

Note: *** p<0.01, ** p<0.05, * p<0.1

On the whole, the largest predictor of PPP investments for the SSA sub-region is the favorable market conditions as established by the population size and purchasing power estimated by the GDP per capita. While the population size was positively significant at 1%, the GDP per capita was also positively significant at 5%. This therefore makes it critical to consider these two factors when issues of private

sector investment for PPP are being assessed, especially in the case of private sector entities with the desire to engage in PPP arrangement in the sub region.

However, the results indicate that the amount of PPP investment received was significantly and positively influenced by aid, and negatively impacted by business regulatory quality at 5% and 1% respectively and this is the opposite of what was anticipated for the study. Also, as expected other factors such as inflation, exchange rate stability and current account balance negatively influenced the amount of PPP investment received while law and order as well as government stability positively impacted the amount of PPP investment received. Nonetheless, these factors are statistically insignificant for the period under review (2005-2014).

4.3 Robustness Check

The following alternative specifications were tested to ascertain the robustness of the regression model:

- ***Test 1****:* the ***Regulatory Quality Index*** from the World Banks' World Governance Indicators (WGI) was introduced as an alternative explanatory variable in place of the IEF Business Freedom Index. The outcome is shown below as Table 3.
- ***Test 2***: Here, the benchmark model was tested with and without observations from South Africa along all three models (OLS, Fixed Effect and random effect GLS) to determine veracity of the results. The result is shown below as Tables 4 and 5 for tests with and without South Africa respectively.

Table 3: Regression Result for Robustness with Introduced Variable

Dep. Variable: Amount of PPI Investment (ln[PPI+1]; Random - GLS		
Variables	**Coefficients**	**Rob. St. Error**
Inf	-0.027	0.0203
ExRate	-0.0289	0.0608
ln_pop	2.303***	0.281
ln_gdppc	0.419*	0.237
ln_naidpc	0.531**	0.225
CA_Bal	-0.0033	0.0214
L_order	0.088	0.168
G_Stability	0.0438	0.0612
reg_qty	**-0.304**	**0.432**
B_Qty	0.425**	0.2
Constant	-14.71***	3.444
No. Observations	360	
No. of Countries	36	
No. of Years	10	
R-Squared	0.216	

Note: *** p<0.01, ** p<0.05, * p<0.1

Table 4: Regression Results for Robustness with South Africa

Dep. Variable: Amount of PPI Investment (ln[PPI+1])						
Variables	**(OLS)**		**Fixed Effect (FE)**		**Random Effect (RE)**	
	Coefficients	**Rob. St. Error**	**Coefficients**	**Rob. St. Error**	**Coefficients**	**Rob. St. Error**
Inf	-0.0329	0.0221	-0.00114	0.0219	-0.0311	0.0201
ExRate	-0.00431	0.0774	0.00942	0.079	-0.00866	0.0593
ln_naidpc	0.513**	0.317	0.38	10.23	0.521**	0.286
CA_Bal	-0.00633	0.16	0.0156	1.003	-0.00599	0.186
ln_pop	2.251***	0.216	-1.371	0.386	2.255***	0.247
ln_gdppc	0.376**	0.0135	2.551***	0.0296	0.389**	0.0187
L_order	0.106	0.212	1.207	1.175	0.103	0.16
G_Stability	0.0159	0.0823	0.316*	0.198	0.0223	0.0572
B_Fdom	-0.0157*	0.00819	-0.0265*	0.0159	-0.0158*	0.00925
B_Qty	0.400*	0.215	2.623*	1.498	0.400*	0.179
Constant	-12.99***	3.162	-7.868	67.57	-13.14***	3.011
No. Observations	360		360		360	
No. of Countries	36		36		36	
No. of Years	10		10		10	
R-squared	0.223		0.076		0.223	

Note: *** p<0.01, ** p<0.05, * p<0.1

Table 5: Regression Results for Robustness without South Africa

Dep. Variable: Amount of PPI Investment (ln[PPI+1])						
Variables	**(OLS)**		**Fixed Effect (FE)**		**Random Effect (RE)**	
	Coefficients	**Rob. St. Error**	**Coefficients**	**Rob. St. Error**	**Coefficients**	**Rob. St. Error**
Inf	-0.0315	0.0226	-0.0014	0.0274	-0.0298	0.023
Exrate_risk	0.000275	0.0791	0.0121	0.114	-0.00484	0.0809
ln_naidpc	0.529**	0.221	0.372	0.314	0.535**	0.227
CA_Bal	-0.00487	0.0139	0.0159	0.0198	-0.00479	0.0142
ln_pop	2.196***	0.336	-1.462	7.758	2.204***	0.358
ln_gdppc	0.340*	0.174	2.589**	1.001	0.356*	0.184
L_order	0.111	0.216	1.262	1.309	0.109	0.23
G_Stability	0.0131	0.0843	0.330*	0.19	0.02	0.0874
B_Fdom	-0.0165*	0.00844	-0.0267*	0.0141	-0.0166*	0.00881
B_Qty	0.382*	0.22	2.645*	1.558	0.383	0.236
Constant	-12.39***	3.38	-7.552	50.09	-12.60***	3.568
No. of Observations	350		350		350	
No. of Countries	35		35		35	
No. of Years	10		10		10	
R-squared	0.207		0.077		0.207	

Note: *** p<0.01, ** p<0.05, * p<0.1

The robustness check conducted did not significantly change the results. In both instances (test 1 and 2), the favorable market condition variables remain the most significant explanatory variables. In the case of Test 1, all other associations and statistical significance remain with the exception of regulatory quality proxy introduced, which looses its level of significance. Similar to the results of the benchmark model, the regulatory quality index is negatively correlated to the amount of PPI investments. Furthermore, the bureaucratic quality proxy as a measure for institutional quality looses its level of significance when the South Africa is excluded from the sample. This together establishes to an extent, a level of ambiguity in the effect of the regulatory quality and bureaucratic quality indices in determining the amount of PPP investments a country receives considering the fact the significance of the coefficient is lost with the introduction of the new variable and exclusion of South Africa respectively. Nonetheless, all other statistically significant factors from the results of the benchmark model continue to remain.

Also, the robustness check with the Test 2, which compares three (3) different regressions with and without the potential outlier (South Africa), suggest that in addition to the favorable market conditions, institutional and regulatory factors that are significant, government stability as proxy for governance and political climate is somewhat significant in the determination of PPP investment in the region under the fixed effect regression model with and without the potential outlier. Here, the significance of the governance index goes to support what was hypothesized in this study and also underscored by previous studies. Overall, the robustness checks support the earlier results of the benchmark model.

4.4 Discussion

The results of the study shows quite interesting results and associations in reference the key determinants for private sector engagement in PPP for infrastructure provision in the Sub-Saharan Africa region. Firstly, the favorable market conditions (using population size and GDP per capita) is the largest predictors and determinant of private sector investment in the SSA region and this assertion is further supported by the results of the robustness check that confirms same. This supports the study hypothesis and is consist with the findings from earlier studies on the sub-region and other regions which have indicated that, larger market size coupled with increased consumer ability to pay is significantly correlated with higher PPP investments (Bogado, 2015; Hammami et al., 2006; Lamech & Saeed, 2003). .

That not withstanding, it is a generally accepted assertion from a policy and economic perspective that an increase in per capita GDP has a direct positive impact on the quality of life, which also comes with greater demand for infrastructure. For that much, its is conventional to anticipate that higher demand and willingness to pay for infrastructure provision in the sub-region through PPP considering the higher population growth rate (as depicted by the summary results in Table 1) coupled with increased undersupply of adequate infrastructure.

Furthermore, the results also support the study hypothesis and previous studies (Hammami et al., 2006; Lamech & Saeed, 2003) that well-structured and administered institutions positively affect the level of PPP investment in the sub-region. This is supported by the argument that PPP's by their nature are complex contractual arrangements that require strong institutions underpinned by robust government policies towards its fruitful functioning. This makes quality institution an indisputable factor for determining private sector investments, particularly in PPP engagements.

Conversely, the macroeconomic conditions (inflation, exchange rate stability and current account balance) did not seem to influence PPP investments in the SSA region and much as we anticipated. This is possibly as a result of the fact that the observations were too wide apart and for that much, the non-significant results at the regional level. That notwithstanding, the relationship established by the coefficient is as predicted by the hypothesis in the case of inflation, exchange rate stability and current account balance.

However, the study have revealed that PPP investments in the sub-Saharan region have thrived amidst higher regulatory burden for business transactions as well as increased availability of alternative means of financing such as aid. These findings oppose the study hypothesis and what might have seemed to be a prevailing factor for influencing private sector investments in any market. The risk here is that these investment may be going into sub-optimal infrastructure that serve private interest.

In the case of the regulatory environment, this finding supports earlier findings of Mengistu (2013) and Banerjee, Oetzel, and Ranganathan (2006) who argued that, such results may be driven by location specific advantages (e.g. natural resource availability) which are the very reasons influencing the PPP investments.

Besides that, this findings could be influenced by the fact that SSA region is different from other regions and emerging markets as established by the findings of Asiedu (2002). While a higher return on investment amongst others had impacted positively on foreign direct investment (FDI) to non-SSA countries, no such implications could be drawn in the case of the SSA (Asiedu, 2002). However, openness to trade stimulated FDI to SSA and this could be the potential driving force behind the PPP investments in the sub-region amidst higher regulatory burden.

Therefore, the mere uniqueness of the SSA underpinned by its open trade policies could drive PPP investment.

Another possible explanation to this finding from the policy perspective is the fact that, the whole concept of PPP has assumed relevance as a global trend and perhaps, the most feasible alternative to infrastructure financing to deliver value for money. Also, international agencies are mostly noted to be advocating same; for an increased private sector engagement in ventures such as PPP particularly for infrastructure financing (Kasri & Wibowo, 2015). As such, specific PPP related policies may be adopted at the sector level to facilitate PPP ventures but may not be directly associated with the overall regulatory climate of the country as the perception based indices may define. Therefore, amidst much weaker regulatory environments, developing country may have adopted PPP as a more feasible financing arrangement to deliver infrastructure with value for money. This claim can be supported by the findings of EIU that have indicated that some SSA countries have engaged in PPP arrangements without the overarching laws to support them (Economist Intelligence Unit, 2015).

Also, a possible explanation why the access to alternative forms of funding such as aid is not reducing the amount of PPP investment is the fact that, aid assistance over the past decade has been transformed such that it may not directly translate to the availability of funds for infrastructure provision. While the demand for infrastructure has increased significantly considering the rapid population growth rate in the sub region, aid disbursement particularly to SSA is rather tailored for particular needs that may not directly turn into development programs and projects (Kharas, 2007).

Also, the PPP investment to the SSA region is unevenly distributed based on sub-sector categorization. A critical look at the amount of PPP investment by sector reveals a monotonous investment for ICT sub-sector, accounting to approximately 70 percent of the total investments to the region with the water and sewerage sub-sector receiving less that 1 percent of the total investments. This trend may be underscored by the growing demand for ICT to facilitate communication and other activities however, the other sub-sector such as transport, water and sewerage as well as energy are equally important and in deficit of supply in terms of quantity and quality.

Additionally, the paradigm of aid ineffectiveness have evolved, and many have argued that the conditions with which these aid amounts are disbursed tend to result in wastage in the use of overly priced goods and services underpinned by aid amounts that are used to open donor recipient markets to donor products (Shah, 2014). This may have some positive impacts but at the same time, has the potential to increase the demand for alternative financing such as the PPP to finance the growing demand for adequate infrastructure.

RECOMMENDATIONS AND CONCLUSION

5.1 Policy Recommendations

The various findings of the study have policy implications for policy makers, as well as key knowledge worth noting by prospective investors and the academia that seek to broaden the body of knowledge on the subject area. Although the SSA region has realized some PPP investments for infrastructure provision, these realized investment amounts continue to remain low compared to the other regions of the Low and Middle Income Countries (LMICs). In view of that, the following recommendations are made:

The favorable market conditions remain the most significant determining factors and should be given priority in the policy arena. It is critical to formulate policies that improve and expand the market conditions considering the fact that they do not only facilitate PPP investment but can also be linked to, among other things, the quality of life of the citizens of a country. While the market condition related policies could be one of many difficult policy areas to deal with, an overall prioritization of the advancement of the individual ability to pay as a macroeconomic prospect is worth the take.

Also, the institutional quality with relation to its ability to conduct business effectively and efficiently is important to advancing the course of PPP in infrastructure provision. As such, it is important to embark on reforms where necessary to upscale the quality of institutions to deliver on their mandate. Furthermore, various countries in the SSA region should build on the experience for implementing PPP, underscored by vigorous capacity building program that will seek to expand the knowledge base and ability of the institutions to effectively respond to the needs of engaging in PPP ventures.

This will further enhance the quality of the intuitions to deliver on PPP related transactions.

On the other hand, though the regulatory environment was significant but opposed the suggested claim of the study, it is important to consider the very implications that such finding have for the business environment. Here, SSA countries as well as the various international agencies that are advancing the course of PPP as an alternative financing tool should design new policies that will seek to advance long-term PPP investments in business climates that are adequately regulated. This could potentially minimize the incidence of distressed projects and potential implementation of PPP in areas that tend to benefit specific individuals at the expense of the overall populace wellbeing.

Adding to this, the overall role of international and regional agencies cannot be overstressed. Amidst weak regulatory environments that continue to challenge the SSA region, international and regional agencies could provide guarantees coupled with equity funding and other risk management mechanism that will seek to reduce the various country risks and expand the potential for increased PPP investment for infrastructure.

5.2 Recommendations for Future Studies

The findings of this study go to augment the findings of several other bodies of knowledge that exist on the subject matter. Particularly for the SSA region, more studies need to be conducted towards advancing the amount of PPP investments due to the fact that, the region predisposes a significant characteristic that differentiates it from other regions as findings of this study have supported. Future studies on the subject matter may

also consider establishing the relationship between trade and PPP investment. Specifically, the potential of free trade policies may be assessed as a determinant in advancing PPP investments in a given country. Additionally, the findings of this study have established the potential for PPP specific regulations and policies to advance PPP engagements in a given country and this may hither to not directly relate to the overall regulatory environment of the country. As such, future studies could consider the potential impact of PPP specific policies and institutions on PPP Investments.

5.3 Conclusion

The overall importance of infrastructure to supporting and sustaining development in any given country cannot be overemphasized. Further, globalization and urbanization trends coupled with growing budgetary constraints in financing infrastructure has heightened the need to identify alternative means of delivering infrastructure in their right quantity and quality to achieve value for money.

Specifically, while the Sub-Saharan region has been characterized as lacking the needed infrastructure in their right qualities and numbers, the region continues to underscore a great demand considering its high population growth amongst others. As such, Public Private Partnership (PPP) has been adopted as an alternative financing tool for infrastructure provision but however, the level of investment in the SSA region continues to remain low in comparison to other Low and Middle Income Country (LMIC) of other regions.

This study was therefore geared towards identifying the key determinants for private sector engagements in PPP for infrastructure provision in the Sub-Saharan Africa

region with critical emphasis on the macroeconomic situation, favorable market conditions, governance and political climate as well as the institutional and regulatory quality.

Overall, this study reveals indicate that the favorable market conditions (population size and GDP per capita) as well as quality institutions are the most significant determinants for PPP investment in the region; for which the various governments and private sector entities seeking to engage or invest in PPP respectively ought to pay critical attention. While opposing to the claim of the study, aid and higher regulatory burden rather significantly influenced PPP investments in the sub region. However, the robustness check also revealed that government stability could somewhat significantly determine PPP investment but this is not a conclusive hypothesis under the model adopted for the study. Additionally, we do not have enough evidence to suggest that the favorable macroeconomic conditions (inflation, exchange rate stability and current account balance) significantly determine PPP investments in the SSA region.

There is therefore the need to formulate and design policies that will significantly improve the market conditions while strengthening the capacity of the institutions to effectively and efficiently attract the needed PPP investment for infrastructure provision in the sub-region. Also, international and regional agencies should provide some form of guarantees and risk management mechanisms to facilitate private sector investments in the sub-region amidst the limited regulatory environment. Above all, the policies should be geared towards advancing long term PPP investments to SSA in an adequately regulated business environment.

Finally, we acknowledge that the study may have limitations particularly in terms of the model specifications and the specific data that was used. Nonetheless, we believe the findings as have been outlined and discussed provide some significant insights that are worth considering in expanding PPP investments for infrastructure provision. Also, this study has contributed to adding to the body of knowledge that exists on the subject matter while providing a new line of direction for future studies.

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APPENDICES

Appendix 1: Data Variables and Source

Categorization	Hypotheses	Expected Effect	Variables	Data Source
Macroeconomic Situation	Hypothesis 1: PPP will be lower in countries with higher inflation rate and unstable exchange rate	Negative	- Inflation rate - Exchange Rate Stability	- World Bank Word Development Indicators - ICRG Country Data
	Hypothesis 2: PPP will be lower in countries with adequate revenue and external funds such as aid	Negative	- Net Aid Per Capita (log) - Current Account Balance	- OECD Database - Word Development Indicators (WDI)
Favorable Market Conditions	Hypothesis 3: PPP will be higher in countries with higher demand and higher purchasing power	Positive	- Population (log) - GDP per Capita for Purchasing Power (log)	- WDI
Governance and Political Climate	Hypothesis 4: PPP will be higher in countries with a stable political and accountable system	Positive	- Law and Order - Government stability rating	- International Country Risk Guide (ICRG) Country Data
Institutional Quality and Regulatory System	Hypothesis 5: PPP will be higher in countries with well-structured and administered institutions, and regulatory framework for the business environment.	Positive	- Business Freedom - Bureaucracy quality	- Index of Economic Freedom - ICRG Country Data

Source: Authors Construct, 2017

Appendix 2: Hausman Test Results

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Inf	-.0011437	-.0310643	.0299205	.0149811
ExRate1	-.0094167	.0086575	-.0180742	.0785803
ln_pop	-1.371312	2.255276	-3.626588	7.606957
ln_gdppc	2.551435	.3889958	2.162439	.967531
ln_naidpc	.3803422	.5210097	-.1406675	.2130699
CA_Bal	.0155966	-.0059905	.0215871	.0137307
L_order	1.206751	.1032013	1.10355	1.237587
G_Stability	.3162783	.0223071	.2939713	.1609303
B_Fdom	-.0264993	-.0157966	-.0107027	.0109488
B_Qty	2.622615	.4002211	2.222394	1.517943

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 17.47
Prob>chi2 = 0.0647