Strathmore UNIVERSITY

The Growth Effect of External Debt and FDI in Sub-Saharan Africa: The Role of Institutional Quality

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ABSTRACT

Much of the literature on the relationship between external debt, FDI and economic growth focus on the direct effect external debt and FDI has on economic growth. It is difficult to find research addressing the role of institutions in the relationship between the three variables. This study aims to investigate the effect institutional quality has on the relationship between external debt and FDI on economic growth. To achieve this objective, the fixed effects model is estimated with data from 6 Sub-Saharan African countries over the years 2000 to 2018. The empirical results find that both the interaction terms between external debt and corruption, and FDI and corruption to be positive and statistically significant. This confirms the institutional quality of an economy play a role in the effect external debt and FDI have on economic growth. It is determined that when countries have stronger institutions, the effect of external debt and FDI on economic growth is enhanced.

LIST OF ABBREVIATIONS

IMF - International Monetary Fund

AMCP - Africa Monetary Cooperation Programme

AfDB - African Development Bank

SSA - Sub-Saharan Africa

HIPC - Highly Indebted Poor Countries

MDRI - Multilateral Debt Relief Initiative

GDP - Gross Domestic Product

GNI - Gross National Income

FDI - Foreign Direct Investment

UNCTAD - United Nations Conference on Trade and Development

GNI - Gross National Income

CPI - Corruption Perception Index

CHAPTER ONE

INTRODUCTION

1.1 Background

In recent years Africa's debt appetite has increased. The average debt-to-GDP ratio in Africa has grown by almost half from 40% in 2010 to 59% in 2018 pointing to the fact that indeed Africa countries are rapidly accumulating debt. 24 countries exceeded the 55% debt to GDP ratio as recommended by the IMF with a further 19 countries exceeding 60% debt to GDP ratio threshold established by AMCP[1].

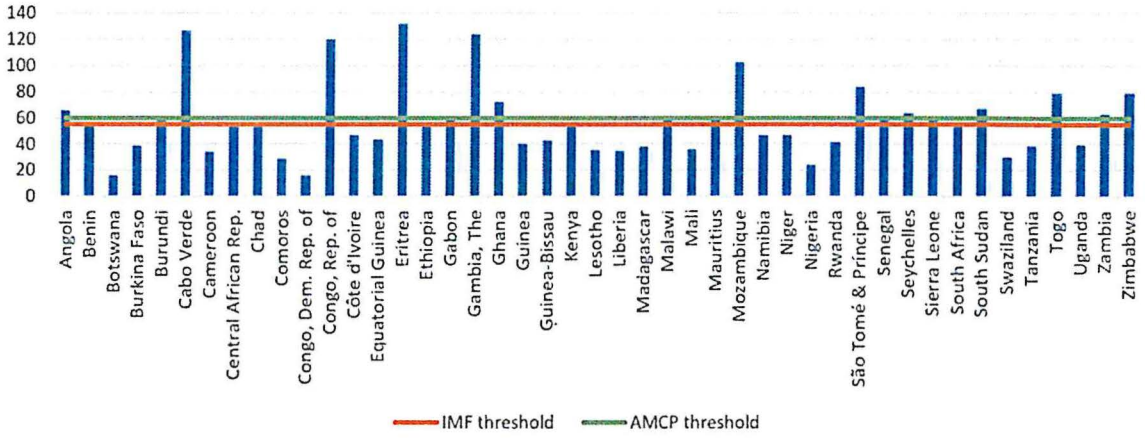

Figure 1.1 Government debt to GDP for African Countries, 2017.

Source: IMF, 2018. Regional Economic Outlook

The current debt scenario is, however, differing from the HIPC and MDRI era. Governments have been obliged to stimulate their economies in the aftermath of the 2008 financial crisis to compensate for reduced private sector demand, leading to increased public spending. Africa also needs to spend around $130 - $170 billion annually to close the infrastructure gap with the developed world and have a financing gap in the range of $67.6 - $107.5 billion[2] (African Development Bank, 2018). A recent example is the US $6 billion Eurobond Kenya recently acquired from 3 different issues in 2014, 2018, and 2019 for infrastructural requirements. This

[1]International Monetary Fund (IMF), 'Regional Economic Outlook: Sub-Saharan Africa', 2017a, https://www.imf.org/en/Publications/REO/SSA/Issues/2017/05/03/sreo0517.

[2]According to estimates by the African Development Bank (AfDB), ' Africa's Infrastructure: Great Potential but Little Impact on Inclusive Growth', 2018, https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/2018AEO/African_Economic_Outlook_2018_-_EN_Chapter3.pdf

is yet another factor leading to increased debt accumulation. The 2014 commodity price shock caused many countries' currencies to depreciate thus ballooning the foreign denominated debt, mixed with the reduced government revenue put the government in a tough position and forced them to further borrow to meet public expenditure. SSA countries have also been moving away from official multilateral creditors toward more non-concessional debt accompanied with greater interest rates and short maturities. All these factors have raised concerns about the debt's effect on economic growth.

In 2018, Vera Songwe, the executive secretary of the United Nations Economic Commission for Africa disclosed that in Africa, corruption leads to a loss of US $148 billion dollars which is roughly 9% of SSA's GDP[3]. That amount can finance at least 87% of the amount needed for Africa to close its infrastructural gap, hence, reducing the need for these countries to take on debt for infrastructural development. The economic cost of corruption on economic development is not only inefficient allocation of resources in the short-term but also irredeemable long-term opportunity costs. An example in Kenya is the misappropriation of $US 210 million-dollar Kimwarer and Arror dams project that was to be constructed in the Elgeyo-Marakwet County. The project, however, turned out to be a phantom project at the expense of the taxpayer. If the project was actualized this would have provided hydropower and a supply of drinking water to the county. Such events stunt the growth of infrastructure, deny individuals potential job opportunities and losses the country revenue.

The West African leaks gave an insight into how high-ranking government officials in West Africa use complex offshore company structures and secrecy jurisdictions to launder money and to abuse public trust. Corruption in Africa is not exclusive to high-ranking government officials, according to a survey conducted by Transparency International more than one in four people, in the 35 countries surveyed, paid bribes to access public amenities such as health care and education and the most corrupt public office is held by the Police[4].

[3]According to an estimate by World Bank of SSA GDP in 2018 of US $1,714 billion dollars : https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=ZG.

[4]Global Corruption Barometer (GCB) Africa , 'Citizens' Views and Experiences of Corruption, 2019, https://www.transparency.org/en/gcb/africa/africa-2019.

Country	Quality of Policies & Institutions
Angola	Weak
Benin	Medium
Burkina Faso	Medium
Burundi	Weak
Cape Verde	Medium
Cameroon	Weak
CAR	Weak
Chad	Weak
DRC	Weak
Congo	Weak
Cote d'Ivoire	Medium
Djibouti	Weak
Egypt	Strong
Equatorial Guinea	Weak
Eritrea	Weak
Ethiopia	Medium
Gabon	Medium
Gambia	Weak
Ghana	Medium
Guinea	Weak
Guinea-Bissau	Weak
Kenya	Strong
Lesotho	Medium
Liberia	Weak
Madagascar	Weak
Malawi	Weak
Mali	Medium
Mauritania	Medium
Mauritius	Strong
Morocco	Strong
Mozambique	Weak
Namibia	Strong
Nigeria	Medium
Niger	Medium
Rwanda	Strong
Senegal	Strong
Sierra Leone	Weak
South Africa	Strong
Sudan	Weak
Sao Tome and Principe	Weak
Tanzania	Medium
Togo	Weak
Tunisia	Strong
Uganda	Medium
Zambia	Medium
Zimbabwe	Weak

Figure 1.2: A glance of the quality of institutions in SSA

Source: CPIA Africa, July 2018: Assessing Africa's Policies and Institutions.

Figure 1.2 provides a glimpse of the quality of the institutions tend to be found within the region. It gives a stark image of the quality of the institutions with only nine of the 46 countries being determined to have strong institutions, with three of them being located outside SSA. 22 of the 46 countries are shown to have weak institutions representing majority of the SSA region.

Global FDI declined from US$ 1.5 trillion to US$ 1.3 trillion in 2018, according to UNCTAD. However, FDI in Africa increased by 10.9% to US$ 45 billion in 2018 despite global FDI falling 3 years consecutively. This indicates the global market's interest in establishing long-term business relationships with African countries. FDI aids in the growth of the recipient country, as they not only receive jobs but also expertise, training, and technology.

Figure 1.3 shows that FDI had created almost half a million jobs in Africa between 2014 and 2018.

Country	Projects	Jobs created	Capital US$m
USA	463	62 004	30 855
France	329	57 970	34 172
UK	286	40 949	17 768
China	259	137 028	72 235
South Africa	199	21 486	10 185
UAE	189	39 479	25 278
Germany	180	31 562	6 887
Switzerland	143	13 363	6 432
India	134	30 334	5 403
Spain	119	13 837	4 389

Figure 1.3: FDI to Africa by Country (2014-2018)

Source: FDI Intelligence and EY Africa Attractiveness Report, 2019

1.2 Trends of Debt, Corruption and FDI in Africa

High debt levels, corruption and slow economic growth have plagued African countries. Africa has been trailing in economic development compared to other regions around the world, despite being a resource- rich continent . The decision to focus on African countries is driven by the cultural aspect of corruption as well as the weak institutions tend to be found within these nations, therefore, by focusing on African countries exclusively it decreases the chances of cultural heterogeneity. Most African countries suffer from high levels of corruption, which some economists argue has the tendency to facilitate economic exchange by overcoming regulation (Lambsdorff, 2005; Hunting, 1968; Leff, 1964). However, African countries tend to have decentralized corruption, which means payment of a bribe could fail to render a service, which is more damaging to economic development than centralized corruption in which a bribe renders a quid pro quo. Corruption is therefore likely to have a varying economic effects in various parts of the world.

Table 1.1: Corruption Ranking of Selected SSA Countries

	Global Ranking	Corruption Index
S.A	70	4.4
Ghana	80	4.1
Kenya	137	2.8
Uganda	137	2.8
Angola	146	2.6
Nigeria	146	2.6

According to the World Bank (2018) external debt stock in SSA stood at US$583.6 bn in 2018, up by 4.9% from 2017. Out of the total, 60% in 2018 was held by 6 SSA countries, namely, Angola, Ghana, Kenya, Nigeria, South Africa and Uganda. Table 4 represents the debt stock movements of the 6 SSA countries between 2010 and 2018. The rise ranges between 66.5% to 292.4% which is extortionate and exhibits just how dependent SSA are on external debt. The persistent rise on external debt raises concerns as to the effects it may bare on these economies' growth.

Table 1.2 External Debt Stock of Selected SSA Countries

Country	2010	2018	% Change
Angola	26,599.6	52,617.6	97.8
Ghana	8,360.1	22,353.7	167.4
Kenya	8,856.2	26,829.8	202.9
Nigeria	15,484.2	40,474.8	161.4
South Africa	108,391.6	180,496.8	66.5
Uganda	2,979.0	11,688.5	292.4

According to UNCTAD(2019), FDI flows to SSA rose by 13% to US$ 32 billion with flows stable at US$ 9 billion in the East Africa region, Kenya experienced an increase by 27% to US$ 1.6 billion. Flows to West Africa sank by 15%, to US$ 9.6 billion, mainly due to Nigeria due to a fall in flows by 43% to $2 billion. Ghana also experienced a dip of 8%, to US$ 3 billion. Southern Africa saw a reversal with flows recovering to US$ 4.2 billion.

1.3 Problem Statement

In recent years SSA countries have been accumulating external debt rapidly in the past 8 years the 6 SSA countries under consideration having increased their external debt stock by 98%, representing a large accumulation of external debt in recent years. The weak institutions tend to be found in these countries would raise concerns about whether the debt being taken on is being utilised for the growth of the economy. The effect of taking on this debt on the economic growth of the SSA region is yet to be established.

Foreign investment into SSA has been growing, in the face of a global decline of FDI. Over 500,000 jobs have been created and attracted US$ 214 billion in capital invested, over a 4-year period ending in 2018, owing to FDI from 10 countries. However, SSA still accounts for a miniscule portion at 3% of global FDI. Would SSA, therefore, benefit from attracting more foreign investment flows.

Despite SSA's pledge to fight against corruption, the region still suffers from high levels of corruption with the region trailing compared to other regions around the world. Africa losses approximately US $148 billion to corruption and if these funds were properly utilized for economic growth it would provide a significant boost in the financing of development requirements, as such an amount could finance at least 87% of the amount needed for Africa to close its infrastructural gap with the developed world. It is unknown whether the direct and

indirect effects of establishing stronger policies and institutions would have a significant effect on the economic growth of the region.

Previous studies on the relationship between external debt, FDI and economic growth have focused on the direct effect of FDI and external debt on economic growth. With the studies obtaining varying results on its effects on economic growth. A few other papers have accounted for the role of institutional quality as a factor contributing to the utilization of debt on economic growth. This study will be concerned with the marginal effect of external debt and FDI on economic growth dependent on institutional quality, which is proxied by corruption, in SSA countries.

1.4 Research Question

This study is concerned with establishing the marginal effect of external debt and FDI on economic growth dependent on institutional quality in SSA. The specific questions of the study are:

1) What is the marginal effect of external debt on economic growth dependent on institutional quality in SSA?
2) What is the marginal effect of FDI on economic growth dependent on institutional quality in SSA?

1.5 Objectives

1.5.1 General Objective

The main objective of the study was to establish the effect of institutional quality on the relationship between external debt and FDI on economic growth.

1.5.2 Specific Objective

The specific objectives of the study are as follows:

1) To determine the marginal effect of external debt on economic growth dependent on institutional quality in SSA
2) To determine the marginal effect of FDI on economic growth dependent on institutional quality in SSA

1.6 Significance of the Study

The study is of theoretical and empirical importance. The study employs the exogenous growth theory to the SSA countries, therefore applying the theory in the context of developing economies. This study is of use to Central Banks, Treasury Ministries and Policy Makers of the respective economies used as well as similar economies, in determining the effect that the strength of the institutions have in the utilization of the external debt taken on economy growth. The study is also of importance to investors within and outside these economies to establish whether to employ their capital in an economy dependent on its institutional characteristics. Furthermore, the study is expected to increase to the already established literature on the relationship of external debt, FDI, institutional quality and economic growth useful to other scholars and researchers.

1.7 Scope of the Study

The study on the marginal effects of external debt and FDI on economic growth dependent on institutional quality was to be conducted among 6 SSA countries between the year 2000 to 2018. The study was conducted over a 19-year period as the data availability on corruption is limited, with all countries having data available as of 2000 onwards. Chapter one of the study covers the introduction and background of the study. While the rest of the study will read as follows; chapter two presents the literature review while chapter three describes the research methodology. Chapter four exhibits the empirical findings and chapter five presents the summary, conclusions, and implications.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter discusses the literature related to external debt, FDI and economic growth. Section 2.1 presents the theoretical literature while section 2.2 presents the empirical literature that describes the effect of FDI and external debt on economic growth. Section 2.3 concludes the chapter with the overview of the literature.

2.1 Theoretical Literature

The theoretical literature on economic growth is largely based on two growth models, the: exogeneous growth model and endogenous growth model.

The exogeneous growth model established by Solow (1956) suggests that exogeneous factor inputs, such as capital and labour, cause economic growth. Furthermore, the exogeneous growth model assumes diminishing returns to capital, this means that capital inputs such as external debt and FDI would affect economic growth in the short run, while in the long run the recipient country would converge to its steady state, and any further positive impact on economic growth is caused by permanent technology shocks (De Mello, 1997). The exogeneous growth model shows that FDI and external debt directly impact economic growth through capital stock accumulation and the inclusion of foreign technology in the production function of the recipient country.

The endogenous growth model suggests that economic growth is driven by technological advancement, through externalities that offset the diminishing returns to capital, as well as human capital stock (Romer, 1990). FDI encourages technology transfer, this has the effect of increasing the productive capacity of the input factors. The endogenous model argues that technological advancement is an endogenous factor unlike the exogeneous theory postulates.

The conventional view on the link between external debt and economic growth affirms that in the relationship is positive in the short run, while in the long run the effect on economic growth is negative (Elmendorf & Mankiw, 1999). Barro (1974) suggests that the rational economic agents expect a future economic burden due to the debt, they will therefore opt to save the corresponding amount, this phenomenon is also referred to as the Ricardian Equivalence. Similarly, the debt overhang hypothesis postulates that an accumulation in debt leads to a future tax on output, this discourages investment and public sector spending on infrastructure projects this leads to drop in economic growth.

From the reviewed theories, economic growth is a function of:

$$Ec = f(K, H, A, L) \tag{2.1}$$

Where :

K – Physical Capital

H – Human Capital

A – Multifactor productivity level

L – Hour of labour employed

2.2 Empirical Literature

The empirical literature on the effect of FDI on economic growth has produced conflicting results. Some of the studies that indicated a positive relationship of FDI on economic growth include Li and Liu (2005). The study covered a period spanning over the period 1970 – 1999 seeking to examine the relationship between FDI and economic growth within 84 countries, which was estimated using random effects and fixed effects models which included the extraneous variables interest rates, inflation rate, black market premium and riots. The study concluded that a direct and indirect effect of FDI exists on economic growth. Those findings, however, were not supported by Musibah, et al. (2015), the study using the extraneous variables exchange rates, inflation rates, GNI and balance of payment estimated the relationship between FDI, and economic growth using a standard regression analysis and established there to be a negative effect of FDI on economic growth. Furthermore, Ang (2009) using time series data between 1970 – 2004 for the Thailand economy estimated FDI and its impact on the Thailand economy using an unrestricted error correction model and an instrument variable estimator observed there a negative effect of FDI on economic growth. While other studies determined there no effect between the two variables (Carkovic & Ross, 2002; Hermes & Lensink, 2003).

De Mello (1999) studied foreign direct investment-led growth from a sample of OECD and non-OECD countries over the period spanning 1970 – 1990 and suggests that the varying effects of FDI on the receipt country is primarily based on the country's characteristics. In fact, De Mello (1999) and Borensztein, et al (1998) concluded that FDI acts as a catalyst for technology transfers which go along with an increase in productivity for countries that had the absorptive capacity. Johnson (2006) showed a positive effect of FDI on economic growth in

developing countries while it was not in developed countries. Likewise, in a study by Hermes and Lensink (2003) determined the financial sector development as a factor contributing to the positive effect of FDI on economic growth.

The relationship between external debt and economic growth has yielded mix results, with some studies yielding a positive relationship while other yields negative or even no effect. Ejigayehu (2013) studied the debt overhang hypothesis on HIPC over the period spanning 1991 – 2010. The extraneous variables from the study were population growth, trade balance, external debt to GNI, the debt service export ratio, and net total debt service. The study employed the random effects estimator and found the debt overhang hypothesis not to hold in these countries. However, this finding was contradicted by Shittu et al (2018), the study spanned the period 1990 to 2015 on five SSA countries and, estimating using the Fully modified OLS and dynamic OLS, found that the debt overhang hypothesis holds in these five SSA countries. Empirical studies have been conducted to test the hypothesis of Ricardian Equivalence some studies have supported the hypothesis while others conflict with it. Some of the empirical studies that support the hypothesis Evans (1988; 1991) while some of those that conflict with the results are Laurence, Razin and Rosenthal (1990) and Hayford (1989). Some other researchers argue that the effect of external debt on economic growth is non-linear, with initial positive effects that are no longer available past a certain threshold but instead it stunts economic growth. Pattillo et al. (2011) established the relationship between external debt and economic growth to be non-linear, indicating that the marginal effect of debt becomes negative when the net present value of debt is greater than 20% of GDP.

2.3 Overview

There have been multiple studies that focus on the relationship between FDI, external debt and economic growth. However, there is limited literature on the role of institutional quality in the utilization of FDI and external debt in achieving economic growth. The exceptions are Kim, Ha and Kim (2017), Jalles (2011), Gonzales-Fernandez and Gonzalez-Velasco (2014), Cooray, Dzhumashev and Schneider (2017) and Shittu, Hassan and Nawaz (2018). This is the gap that this study aims to fill, that is the marginal effect of external debt and FDI on economic growth dependent on corruption, which is used as a proxy for a country's institutional quality.

The exogeneous growth theory assume that economic growth emanates from exogeneous factor inputs such as capital accumulation, growth in effective labour and technological progress. The current study will adopt a similar view by assuming that economic growth is driven by external

debt and FDI. The study will utilize the standard panel growth regression model with a modification from Woo and Kumar (2015) with adjustments from Kim, Ha, and Kim (2017), in addition to the inclusion of FDI and the interaction term between FDI and corruption.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The chapter presents the methodology that was used in the analysis of the marginal effect of external debt and FDI on economic growth dependent on corruption. Section 3.1 outlines the research design while section 3.2 presents the theorical framework and section 3.3 the empirical model which presents the model the study is anchored in. Section 3.4 presents that data, and its sources and Section 3.5 discusses the how the objectives intend to be achieved.

3.1 Research Design

This study uses a non-experimental design as it seeks to establish the marginal effects of external debt and FDI on economic growth dependent on corruption without manipulation. A panel data approach that utilizes quantitative data on FDI, external debt, corruption, and economic growth.

3.2 Theoretical Framework

This study will adopt the augmented neoclassical growth model, originally published by Solow in 1956 and advanced by Coupet (2011) to account for the effect of corruption on economic growth. The model postulates that economic growth is accumulated through exogeneous factor inputs. The model is built on the assumption of countries producing a homogeneous good, constant population growth, technology being exogeneous in the short run as well as diminishing returns to capital input in the short run, while in the long run it would converge to its steady state and can no longer have a positive effect on economic growth.

The production function model is of the form (Subscript ,*t*, is omitted for simplification):

$$Y = K^{\alpha} H^{\beta} [A(\rho)L]^{1-\alpha-\beta}, \qquad (3.1)$$

Where :

Y – Economic Output

K – Physical Capital

H – Human Capital

A – Multifactor productivity level

ρ – Corruption level

L – Hour of labour employed

The production functioned is assumed to display diminish marginal returns.

$$\frac{dK}{dt} = S_k Y_t - \delta_k K_t \qquad \text{and} \qquad \frac{dH}{dt} = S_H Y_t - \delta_H H_t \tag{3.2}$$

Where:

S – Gross investment of the factor input

δ_k – Depreciation rate of the factor input

Multifactor productivity,$\hat{A}$, is assumed exogeneous and takes the form:

$$A_t(\rho) = \hat{A}_t e^{-\gamma\rho}, \text{ where } 0 \leq \rho \leq 1 \tag{3.3}$$

Corruption therefore weakens input productivity, that is when ρ takes a positive value.

From the theoretical framework, we see that economic output is a function of:

$$Y = f(K, H, A, \rho, L) \tag{3.4}$$

3.3 Empirical Model

From the theoretical framework, economic growth is a function of physical capital, human capital, multifactor productivity, corruption, and labour. From the reviewed empirical literature other important extraneous variables in this relationship are inflation and trade openness. Furthermore, interaction terms between corruption and FDI, corruption and external debt are introduced to establish the effect of institutional quality in the utilization of FDI and external debt in achieving economic growth. Given these assumptions model 3.4 is extended to equation 3.5 as shown below:

$$\%\Delta GDP_{it} = \beta_0 + \beta_1 Debt_{it-1} + \beta_2 FDI_{it-1} + \beta_3 Corr_{it-1} + \beta_4 * (Debt_{it-1} * Corr_{it-1}) + \beta_5 * (FDI_{it-1} * Corr_{it-1}) + Z'X_{it-1} + \rho_i + \gamma_t + \varepsilon_{it}, \tag{3.5}$$

Where:

$\%\Delta GDP_{it}$ - the annual growth rate of the natural log of GDP for country i.

$Debt_{it-1}$ - the external debt of country i

FDI_{it-1} - the FDI of country i

$Corr_{it-1}$ – the corruption level of country i

X_{it-1} - a vector of extraneous variables, with Z as its coefficients

ρ_i - Country specific fixed effects

γ_t - Period specific fixed effects

ε_{it} = Idiosyncratic error term

3.4 Definition and Measurement of Variables

Table 3.1 displays the variable definition and measurement.

Table 3.1: Data Description

Variable Name	Definition	Measurement	Scale
GDP	The monetary value of all final goods and services produced within a country in a given period, usually one year.	It is measured in US dollars	Ratio scaled variable
Corruption	The misuse of positions of power for private benefit	It is measured by the Corruption Perception Index	Ordinal
External Debt	The portion of a country's debt owed to foreign lenders	It is measured in US dollars	Ratio scaled variable
FDI	The investment of a party in one country into an enterprise in another country	It is measured in US dollars	Ratio scaled variable
Human Capital	This is the knowledge, experience, and skills of an economy's workforce	Average years of secondary schooling	Ratio scaled variable
Inflation	The persistent rise in the general price level of an economy	It is measured by the Consumer Price Index	Ratio scaled variable
Trade Openness	The extent to which a country engages in global trade	It is measured in US dollars	Ratio scaled variable

3.5 Data Sources

This study utilizes secondary data. The variables GDP, external debt, FDI, human capital, government size and trade openness are obtained from the World Bank, while fiscal deficit and inflation were obtained from the IMF. Corruption was collected from Transparency International.

3.6 Data Analysis

The first objective of the study is to determine the marginal effect of external debt on GDP dependent on institutional quality in SSA. The objective is achieved by estimating equation 3.5 and interpreting the marginal effects of external debt as shown in equation 3.6.

$$\frac{\partial(\Delta GDP_{it})}{\partial Debt_{it-1}} = \beta_1 + \beta_4 * Corr_{it-1}, \qquad (3.6)$$

The second objective is to determine the marginal effect of FDI on GDP dependent on institutional quality in SSA. The objective is achieved by estimating equation 3.5 and interpreting the marginal effects of FDI as shown in equation (3.7).

$$\frac{\partial(\Delta GDP_{it})}{\partial FDI_{it-1}} = \beta_2 + \beta_5 * Corr_{it-1}, \qquad (3.7)$$

3.7 Diagnostic Checks

3.7.1 Stationarity Test

The Fisher type test for stationarity was used to test for stationarity of the variables used to model. The null hypothesis is that each series contains a unit root for all i cross sections, while the alternative hypothesis may be some series are nonstationary while the others are not:

$$H_o: \delta_i = 0 \Longrightarrow for\ all\ i = 1,2,\dots,N$$

against the alternative:

$$H_a: \begin{cases} \delta_i = 0 \Longrightarrow for\ i = 1,2,\dots,N_1 \\ \delta_i = 0 \Rightarrow for\ i = N_1 + 1, N_2 + 2,\dots,N \end{cases}$$

The proposed Fisher type test is:

$$P = -2\sum_{i=1}^{N} ln\, p_i$$

Where p_i is the p-value of a unit root test for cross-section i. The p-values from the unit root test for each cross-section are then combined and used to test for unit root of the panel.

Choi (2001) proposes three other test statistics besides Fisher's inverse chi square test statistic.

The first is the inverse normal test:

$$Z = \frac{1}{\sqrt{N}} \sum_{i=1}^{N} \Phi^{-1}(p_i)$$

Where Φ is the standard normal cumulative distribution function.

The second is the logit test

$$P = \sum_{i=1}^{N} \ln \left(\frac{p_i}{1 - p_i}\right)$$

Where $\ln \left(\frac{p_i}{1-p_i}\right)$ has the logistic distribution.

The third test is the inverse modified chi-square, useful when N is large

$$P_m = \frac{1}{2\sqrt{N}} \sum_{i=1}^{N} (-2 \ln p_i - 2)$$

The four test statistics were used to test for stationarity.

3.7.2 Cross-sectional Dependence

The test for cross-sectional dependence tests the null hypothesis of cross-sectional independence within the panels against an alternative of cross-sectional dependence within the panels.

$$H_0: corr(u_{it} u_{jt}) = 0 \ \ for \ \ i \neq j$$

$$H_a: corr(u_{it} u_{jt}) \neq 0 \ \ for \ some \ i \neq j$$

Pesaran (2004) proposed the following statistic to test for cross-sectional dependence:

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \widehat{\rho_{ij}}\right)$$

CHAPTER FOUR

EMPERICAL FINDINGS

4.0 Introduction

This chapter presents the study findings. Section 4.1 outlined the descriptive statistics while section 4.2 presented the correlation analysis. Section 4.3 presented the diagnostic tests carried out on the variables. Section 4.4 presented the empirical results of the analysis.

4.1 Descriptive Statistics

This section presents the statistical properties of the variables used to conduct the study. Table 4.1 presents the statistical properties of the variables used in the study.

Table 4.1: Descriptive Statistics

Variable	Observations (N x T)	Mean	Std. Dev.	Min	Max
GDP (in $US billions)	114	126	144	4.98	568
FDI (in $US billions)	114	1.95	2.99	-7.40	10
External Debt (in $US billions)	114	29.9	37.5	1.30	178
Corruption	114	2.90	1.05	1.00	5.10
Inflation	114	0.16	0.35	-0.01	3.25
Trade Openness ***(% of GDP)***	114	0.62	0.26	0.21	1.53
Secondary Schooling (Years)	114	6.01	0.59	5.00	7.00

Table 4.1 shows that the number of observations over the period of consideration were 114, that is 19 observations in 6 countries. The average GDP of the 6 SSA countries is $US 126 billion dollars with the maximum observation of $US 568 billion dollars and a minimum observation of $US 4.98 billion dollars.

On average FDI within the 6 countries was $US 1.95 billion dollars, with a minimum value of $US -7.4 billion dollars and a maximum value of $US 10 billion dollars. Angola was the only country to experience a negative net FDI and also received the highest amount in of FDI represent significant volatility in the economy in terms on foreign investment. External debt was on average $US 29.9 billion dollars, with a minimum value of $US 1.30 billion dollars and maximum value of $US 178 billion dollars. The average Corruption Perception Index (CPI) score of these six countries was 2.90, Nigeria was the most corrupt country in the period

covered scoring the minimum value of one and South Africa the least corrupt country represented scoring 5.1.

Inflation averaged 16% over the period of the study with a maximum value of 325% and a minimum value of -1%. Fiscal deficit averaged 2% of GDP over the study period with a minimum value of –9% of GDP and a maximum value of 9% of GDP. Trade openness averaged 62% of GDP, with a minimum value of 21% of GDP and a maximum value of 153% of GDP. The average years of Secondary Schooling was 6.01 years for the 6 countries with a minimum of 5 years and maximum of 7 years. On average government consumption was around 13% of GDP, with the minimum being 1% and the maximum was 25%.

4.2 Correlation Analysis

This section presents the correlation coefficients of the variables used to conduct the study. Table 4.2 presents the correlation of the variables used in the study.

Table 4.2:Correlation between Variables

	GDP	FDI	Debt	Corruption	Inflation	Trade Openness	Sec. Schooling
GDP	1						
FDI	0.56	1					
Debt	0.64	0.28	1				
Corruption	0.29	0.34	0.42	1			
Inflation	-0.17	-0.06	-0.13	-0.22	1		
Trade Openness	-0.31	-0.28	-0.65	-0.40	0.37	1	
Sec Schooling	-.0.53	-0.18	-0.05	0.03	0.54	0.45	1

Table 4.2 indicates that GDP growth is positively correlated with FDI, external debt, and increased with decreasing corruption. This is the relationship we would expect from these variables as FDI and external debt are used to enhance GDP, while less corruption would act as a catalyst to spur economic growth. FDI and external debt exhibit a strong correlation with GDP indicating that a positive relationship may exist within these variables.

The variables with a negative correlation with GDP growth are inflation, trade openness and

secondary schooling. Inflation is expected to have a negative effect on GDP; however, it is unique to have a negative relationship with trade openness and secondary schooling, this may indicate that global trade has a negative effect on these SSA countries which could be the case, however, we would expect an increase in the number of years spent in secondary school to have a positive effect with GDP.

FDI and external debt have a positive correlation with corruption, implying an increase in either external debt or FDI leads to a decrease in corruption severity, however, it may be a possibility of spurious correlation whereby the series may have appeared correlated due to the time-series aspect, but the correlation was not meaningful.

4.3 Pre-estimation Diagnostic Tests

4.3.1 Stationarity Tests

Table 4.3 shows the summary of the findings on stationarity. The tests have a null hypothesis of presence of a unit root. Therefore, a rejection of null hypothesis would imply that the series in question was stationary.

Table 4.3: Stationarity Test

	Fisher Type Test			
Variable	Chi-Square	Normal	Logit	Modified Chi-Square
GDP ^	25.08**	-1.97**	-2.15**	2.67***
FDI	36.45***	-2.86***	-3.50***	4.99***
External Debt '	24.04**	-2.20**	-2.25**	2.46***
Corruption^	35.962 ***	-2.79***	-3.45***	4.89***
Inflation	42.62***	-4.50***	-4.79***	6.25***
Trade Openness '	59.54***	-5.97***	-6.79***	9.70***
Human Capital ^"	29.97***	-4.61***	-6.08***	3.67***

Key : *** p-value<0.01, ** p-value<0.05

^ - Log Variable, ' - Differenced once, " - Differenced Twice

Table 4.3 indicates that GDP was stationary at 5% significance level with a log transformation on the variable while FDI and inflation was stationary at level at a 1% significance level. Corruption was stationary at level at 1% significance level with a log transformation. External debt and trade openness were differenced once to make the series stationary at 5% and 1% significance level, respectively. Human capital was stationary after a log transformation and being differenced twice at 1% significance level.

4.3.2 Cross-Sectional Dependence

Table 4.4 shows the findings of the Pesaran's test of cross-sectional dependence.

Table 4.4:Test for Cross-Sectional Dependence

	Test Statistic	P-Value
Pesaran's test of cross-sectional dependence	1.627	0.1037

Table 4.4 expressed that the data contains no cross-section dependence as we fail to reject the null at 10% significance level, therefore it can be determined that the cross-sections are independent within the period under consideration.

4.3.3 Hausman Test

The model selection technique that was utilized was the Hausman test to determine whether fixed effects estimation or random effects estimation will be appropriate. The null hypothesis of the test is no systematic difference between the estimates of the fixed effects model and the random effects model, under this hypothesis both estimators are consistent, however, random effects is preferred as it achieves the Cramer-Rao lower bounds of efficiency under this hypothesis. The alternative is that there exists systematic difference between the estimates of the fixed effects models and random effects model, under this hypothesis the random effects model is inconsistent and fixed effects is preferred as it is both consistent and efficient under this hypothesis. Table 4.5 show the results obtained for the Hausman test.

Table 4.5: Hausman Test

Test: Ho: difference in coefficients not systematic		
	Chi Squared	P-Value
Hausman Test	77.33	0.000

Table 4.5 concludes that we reject the null hypothesis of difference in coefficients not systematic, in favour of the alternative at a 1% significance level, the fixed effects model is therefore preferred.

4.4 Empirical Results

Table 4.6 presents the empirical results for the 6 SSA countries. The fixed effects estimator was employed. Two models were estimated, one excludes Corruption Perception Index (CPI) as an independent variable while the other includes CPI. This is to determine whether corruption affects economic growth directly or indirectly through external debt and FDI.

Table 4.6: Empirical Results

Variables	Model (1)	Model (2)
	Fixed Effects	Fixed Effects
FDI	-20.13***	-11.13**
	(4.363)	(3.357)
External Debt	-4.570***	-4.586***
	(1.000)	(1.008)
CPI	-	2.043**
	-	(0.515)
FDI * CPI	8.769***	4.937**
	(1.781)	(1.666)
Debt * CPI	0.916**	1.006***
	(0.303)	(0.221)
Inflation	-0.884	-0.910
	(0.565)	(0.607)
Human Capital	0.764**	1.301*
	(0.290)	(0.627)
Trade Openness	-1.673**	-1.600**
	(0.441)	(0.415)
Constant	24.91***	22.90***
	(0.0626)	(0.531)
Observations	102	102
R-squared	0.476	0.611

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

From the above estimation, corruption is shown to have a direct effect on economic growth, with a 1% increase in CPI increasing GDP by 2.04%. Within the extraneous variables, inflation is statistically insignificant in both models, human capital is significant at 5% in model (1) and significant at 10% in model (2). Trade openness is statistically significant in both models, with model (2) indicating that a one percent increase in trade openness leads to a 1.6% decrease in economic growth.

The main focus of the study is on the coefficients of the interaction terms between FDI and corruption, FDI * CPI, and external debt and corruption, Debt * CPI. As shown in table 4.6,

the magnitude of the marginal effects are statistically significant therefore indicating that corruption has a direct and indirect effect implying]that the effect of FDI and external debt varies effects across countries, depending on the level of corruption.

4.4.1 Post estimation

4.4.1.1 Homoscedasticity Test

To test for homoscedasticity, 3 test were employed: the Lagrange Multiplier LM Test, the Likelihood Ratio LR Test and the Walt Test. The null hypothesis of the test implies homoscedasticity of the panel while the alternative indicates that the panel is heteroscedastic.

Table 4.7: Homoscedasticity Test

Panel Groupwise Heteroscedasticity Tests Ho: Homoscedasticity - Ha: Groupwise Heteroscedasticity		
	Chi Squared Statistic	P-Value
Lagrange Multiplier LM Test	19.7496	0.0031
Likelihood Ratio LR Test	9.5305	0.1459
Wald Test	119.887	0.0000

The Lagrange Multiplier LM Test and the Wald test both conclude that the panel contains groupwise heteroscedasticity while the Likelihood Ratio LR Test diverges and instead concludes that the panel is homoscedastic. The panel was treated as heteroscedastic and was therefore estimated with robust standard errors to treat the presence if heteroscedasticity.

4.5 Objective check

4.5.1 The Marginal Effect of External Debt on Economic Growth

The first objective of the study was to establish the marginal effect of external debt on economic growth dependent on corruption. To achieve this objective, we interpret equation 3.6 from the results obtained in table 4.6. If we accept the estimates in model (2), the estimated coefficient of external debt is -4.586 whereas the coefficient estimated for the interaction term on external debt and corruption is 1.006. This implies that decreasing corruption increases the effect of external debt on economic growth.

The marginal effect becomes:

$$Marginal\ Effect_{Debt} = -4.586 + 1.006 * CPI \qquad \textbf{(4.1)}$$

Equation 4.1 implies that when the CPI score is 1 the marginal effect of external debt becomes -3.58 and it increases with an increase in CPI, for example when CPI is 5, the marginal effect increases to 0.444 and when CPI is 10, the marginal effect increase further to 5.474.

Figure 4.1 shows the different effects external debt has at varying levels of CPI. As displayed the less a corrupt a country is the more enhanced the effect of external debt is on economic growth.

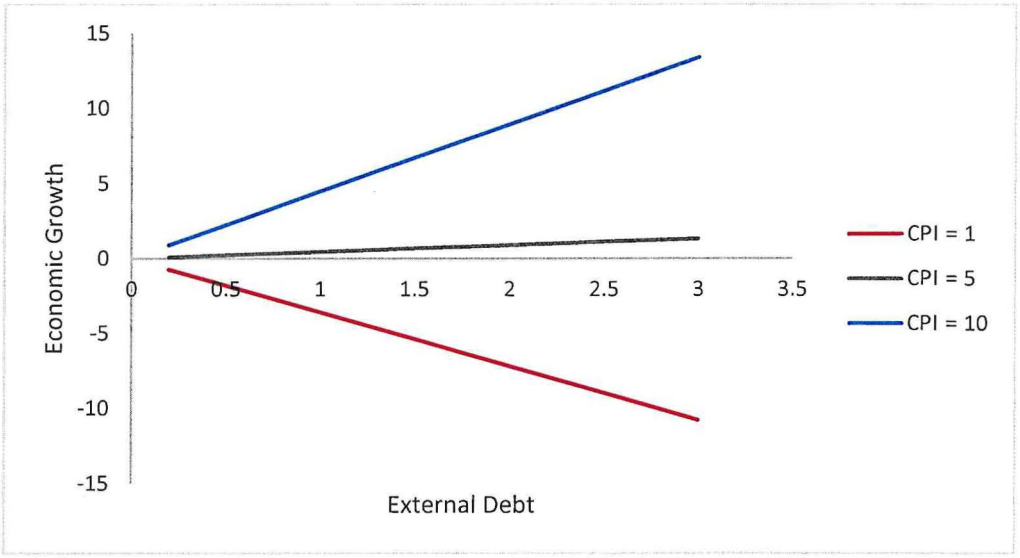

Figure 4.1: Marginal Effect of External dependent on Corruption

Due to the limited literature between the moderating effect of corruption on the relationship between external debt and economic growth, the above results will be compared to that of Kim, Ha, Kim (2017), on the moderating effect of corruption the relationship between public debt and economic growth. The results displayed in table 4.6 are similar to their findings, their estimation result of the interaction term between public debt and corruption was positive. This implies that decreased corruption has a positive moderating effect on the relationship between public debt, which is in line with theoretical prediction. The results in table 4.6 therefore also conform to theoretical implications.

4.5.2 The Marginal Effect of FDI on Economic Growth

The second objective of the study was to establish the marginal effect of FDI on economic growth dependent on corruption. To achieve this objective, we interpret equation 3.7 from the results obtained in table 4.6. If we accept the estimates in model (2), the estimated coefficient of FDI is -11.13 whereas the coefficient estimated for the interaction term of FDI and corruption is 4.937. This implies that decreasing corruption increases the effect of FDI on economic growth.

The marginal effect becomes:

$$Marginal\ Effect_{FDI} = -11.13 + 4.937 * CPI \qquad \textbf{(4.2)}$$

When the CPI score is 1 the marginal effect of external debt becomes -6.193 and it increases with an increase in CPI, for example when CPI is 5 , the marginal effect increases to 13.555 and when CPI is 10, the marginal effect increases further to 38.24.

Figure 4.2 shows the different effects FDI has at varying levels of CPI. As displayed the less a corrupt a country is the more enhanced the effect of FDI is on economic growth.

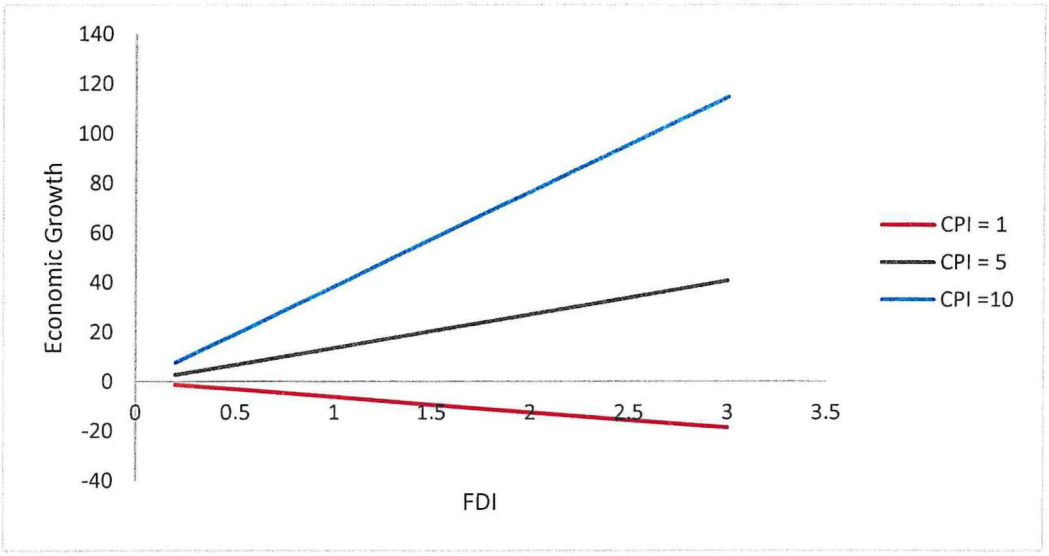

Figure 4.2: Marginal Effect of FDI dependent on Corruption

Figure 4.2 demonstrates that a certain threshold would require to be attained for an economy to obtain a positive effect of FDI on economic growth.

There is limited literature on the moderating effect of corruption on the relationship between FDI and economic growth, however, the results obtained are similar to the findings of Jude and Levieuge (2014), the interaction between FDI and institutional quality was determined to be positive, implying that strengthening of institutions has a positive moderating effect of FDI on economic growth. This is line with the theoretical prediction. Corruption is therefore established to hinder economic growth in line with the 'sand the wheel' hypothesis, rather than the 'grease the wheel' hypothesis.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND IMPLICATION

5.0 Introduction

This chapter presents the conclusion of the paper. Section 5.1 outlined the summary of the study while section 5.2 presented the discussion of the results and the conclusion. Section 5.3 presented the policy implications whereas section 5.4 presented the contribution to knowledge made by the paper. The chapter concludes with section 5.5 which looks at the areas of further research.

5.1 Summary

Much of the published literature focus on the direct effect of external debt and FDI on economic growth, the role of institutional quality is rarely addressed. Noticing this vacancy in literature, the main objective of the study was to establish the role of institutional quality on the relationship between external debt and FDI on economic growth. The specific objectives of this study were to determine the marginal effect of external debt on economic growth dependent on institutional quality and to determine the marginal effect of FDI on economic growth dependent on institutional quality.

The study employed a panel data approach over the years 2000 to 2018 for 6 SSA countries. The choice of the extraneous variables was informed by the existing literature. The unit root test utilised was the fisher type test FDI, inflation and corruption were the only variables stationary at level, however, the natural log of corruption was utilized for this study. The Pesaran test for cross-sectional was utilised to determine whether the data exhibited cross-sectional dependence, it was concluded that the cross-sections were independent. The Hausman test was then employed to determine whether the fixed effects or random effects model is more appropriate in estimating the model, the fixed effects model was preferred. Three tests for homoscedasticity were carried out to determine whether robust estimators for the fixed effects would be required to estimate the model, the data exhibited heteroscedasticity and therefore the robust estimation for the fixed effects model was used.

The outcomes of the fixed effects estimation indicated external debt to have an increasing effect on economic growth with diminishing corruption, as indicated by a positive interaction term between external debt and corruption. Countries with a CPI lower than 4.56 were determined to have negative economic growth with increasing external debt. FDI was also determined to have an increasing effect on economic growth with diminishing corruption, as indicated by a

positive interaction term between FDI and corruption. Countries with a CPI lower than 2.25 were determined to have negative economic growth with increasing FDI.

5.2 Conclusion

Institutional quality was determined to have a moderating effect on the relationship between external debt and economic growth within the 6 SSA countries. The findings show that increased institutional strength improves the effect external debt has on economic growth. The threshold from which external debt was established to have a positive effect was at a CPI score of 4.56 and above, with those below the threshold experiencing negative economic growth from increased external debt.

Moreover, the moderating effect of institutional quality on the relationship between FDI and economic growth was established to exist within the 6 SSA countries, with FDI having a positive effect on economic growth beyond a threshold CPI score of 2.25, with countries below this experiencing a negative effect of FDI on economic growth.

Institutional quality therefore modulates the effect of external debt and FDI on economic growth where strengthened institutional quality induces a growth enhancing effect. Institutional quality is determined to have a direct effect as well, with a 1% increase in the CPI score leading to a 2.04% increase in GDP. Therefore, institutional quality does not only affect economic growth through external debt and FDI but also directly, implying by strengthening institutions, the economy will experience growth in addition to improving the growth enhancing effects of external debt and FDI.

5.3 Policy Implication

The policy implication that can be drawn from the findings is that institutional quality plays an important role in determining the effect of external debt and FDI policies on an economy. The existence of a threshold level of institutional quality that modulates the external debt and FDI growth effects raises concerns on the effectiveness of external debt and FDI attraction policies. These policies may have a perverse effect on the host countries unless an improvement of their institutional quality is implemented first. Therefore, sequencing is required in the implementation of economic policies, with a priority given to measures enhancing the domestic institutions before engaging in external debt and FDI attraction policies.

5.4 Contribution to Knowledge

The majority of the published literature on the effects of external debt and FDI focus on the direct effect of external debt and FDI on economic growth without much emphasis on the role institutional strength. This study establishes the role institutions play in the relationship between external debt and FDI on economic growth in the SSA region from a sample of 6 SSA countries. Institutional strength is determined to have a direct and indirect effect, the extent of the relationship between external dent and FDI was established and demonstrates the enhancing effect strengthened institutions have on economic growth.

5.5 Areas for Further Research

This study analysed the role of institutional quality on the relationship between external debt and FDI on economic growth in 6 SSA countries. The findings elicited three suggestions of areas of further research.

First, future research may test this study's finding against other Sub-Saharan countries to determine if the effect institutions play remains significant in determining the effect external debt and FDI have on economic growth.

Second, CPI although widely used may not be a fully representative measure of institutional quality, future research could employ other proxies for institutional quality to determine if the role of institutional quality remains significant.

Third, a study of a country that transitioned from one with weak institutions to strong institutions could be studied over that period and it could be established whether the effect external debt and FDI had on economic growth improved after the transitions from weak to strong institutions.

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