

**FINANCIAL INTEGRATION AND ECONOMIC GROWTH: A CASE
STUDY OF SUB-SAHARAN AFRICA**

BY

SETH OBENG ADU

(10362213)



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DECLARATION

This is to certify that this thesis is the result of research undertaken by Seth Obeng Adu towards the award of a Master of Philosophy (MPhil.) degree in the Department of Economics, University of Ghana.

.....

SETH OBENG ADU

(CANDIDATE)

.....

DATE



.....

DR. YAW ASANTE

(SUPERVISOR)

.....

DATE

.....

DR. ERIC OSEI-ASSIBEY

(SUPERVISOR)

.....

DATE

DEDICATION

This thesis is dedicated to the God Almighty, my family and all my friends.



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First and foremost, I am grateful to the Almighty God for His guidance and protection throughout the entire period of the program. His Grace and mercies have brought this far.

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These notwithstanding, all errors and omissions are the sole responsibility of the author.

Seth ObengAdu

(July, 2013)

ABSTRACT

The study investigates the relationship between financial integration, proxy by portfolio equity flows, and economic growth in Sub-Saharan Africa. To achieve the set objective, we first estimate the baseline growth regression using the Generalized Methods of Moment (GMM) dynamic panel estimation framework, while controlling for initial income, human capital and other factors. The results suggest that portfolio equity flows have a significant positive relationship with economic growth in SSA. As a robust check of the system GMM results, the results of the Random effects-GLS (EGLS) model suggest a negative insignificant relationship between portfolio equity flows and economic growth. However, the EGLS estimator confirms that there exists a significant positive relationship between financial development and economic growth. The inconsistency in the results of the two estimation models leads us to the conclusion that, there is no definite or robust link in the IFI-growth relationship in SSA.

The study also investigates the determinants of portfolio equity flows to the Sub-Saharan African region over the period 1996-2010. Relying on the Generalized Methods of Moment (GMM) dynamic panel estimation framework, the study finds a significant positive relationship between financial development and portfolio equity flows. The results also suggests that trade openness and political stability have a significant negative relationship with portfolio equity flows in SSA. As a robust check, the EGLS estimator confirms that there is a robust positive relationship between financial development and portfolio equity flows to SSA. However, neither trade openness nor political stability is a robust determinant of portfolio equity flows to the sub-region. On the basis of the outcome, the study recommends that policymakers in SSA should adopt a cautious approach to the financial integration process by specifically adopting policies aimed at regulating the activities of foreign banks and their receipts of portfolio equity inflows. Other policies should aim at enhancing financial sector development, export promotion and ensure stable democratic governance.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AEC	African Economic Community
AR	Autoregressive
AREAR	Annual Report on Exchange Arrangements and Exchange Restrictions
ASEAN	Association of Southeast Asian Nations
AU	African Union
CPI	Consumer Price Index
EAC	East African Community
EGLS	Estimated or Feasible Generalized Least Squares
EMEs	Emerging Market Economies
FDI	Foreign Direct Investment
FI	Financial Integration
FM	Frontier Markets
GDP	Gross Domestic Product
GMM	Generalized Methods of Moment
GNI	Gross National Income
IAB	Investing Across Borders
IDA	International Development Association
IFI	International Financial Integration
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
IPS	Im-Pesaran- Shin
LM	Lagrangian Multiplier
ODI	Overseas Development Institute
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
PCF	Private Capital Flows

REC	Regional Economic Communities
RFI	Regional Financial Integration
SSA	Sub-Saharan Africa
UK	United Kingdom
USA	United States of America
WAEMU	West African Economic Monetary Union
WDI	World Development Indicators
WEO	World Economic Outlook
WGI	World Governance Indicators
WLS	Weighted Least Squares
WTO	World Trade Centre

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Over the last three decades, there has been an increase in cross-border capital flows following the elimination of capital controls in advanced countries in the 1980s and in developing countries since the early 1990s. These gross movements of capital across borders are partly attributed to the global search for high rates of return on investment and opportunities to diversify risk internationally. International capital transactions, during the period surged from about 5% of world GDP to over 20% (Chen and Quang, 2012). The removal of restrictions on capital account in the advanced countries was an acknowledgement of the neoclassical assertion of the potential benefits of financial liberalization as a whole.

In principle, financial globalization and financial integration are two different concepts but, they are closely related. Financial Globalization is an aggregate concept that refers to the increasing global linkages created through cross-border financial flows. Financial Integration (FI), on the other hand, refers to an individual country's linkages to the international capital markets (Prasad et al., 2003). In simple terms, financial globalization is the linkages of various financial integrations. Financial integration is also referred to as financial openness or capital account liberalization in some literature. However, these words are used interchangeably since they emphasize cross-border capital mobility. The concept of financial integration is similar to financial liberalization, such that, it proposes that financial markets should be defragmented to enable market forces to ensure an efficient allocation of capital among countries. In other words, the elimination of restrictions on capital mobility will facilitate the movement of capital

from capital-abundant countries to capital-scarce countries to promote investment and growth.

Literature suggests that financial integration if properly sequenced can help augment domestic savings, lower the cost of capital through better risk diversification and resource allocation, facilitate the transfer of technological and managerial expertise, and stimulate the development of the domestic financial sector.

Economic growth, on the other hand, may facilitate a country's linkage with the international financial market.

However, some schools of thought have challenged the assertion of a positive relationship between FI and economic growth. For instance, Edison et al. (2002), observe that International Financial Integration may retard growth in the presence of pre-existing distortions such as weak financial sector and poor quality of regulatory institutions. The ultimate effect will be capital flight and other macroeconomic fluctuations.

Economic growth, on the other hand, may promote greater financial integration as capital begins to flow to economies where rates of return on investment are high. Typical examples are emerging market economies (EMEs) such as China and India, whose impressive growth rates have attracted foreign capital inflows leading to a gradual liberalization of their capital restrictions.

Capital account liberalization also raises concerns particularly for policymakers, as free mobility of capital across borders may be inconsistent with domestic policy goals (Obstfeld and Taylor, 2003). This brings into mind the *macroeconomic policy trilemma* for open economies (also known as the *inconsistent trinity*). It is based on the premise that; an open capital market restricts a government's ability to simultaneously

target its exchange rate and pursue a monetary policy to achieve economic objectives (Obstfeld and Taylor, 2003). In other words, a macroeconomic policy regime can include, at most, two elements of the three policy goals: (1) full freedom of cross-border capital movements; (2) a fixed exchange rate and (3) an independent monetary policy oriented toward domestic objectives.

If capital mobility is restricted, domestic fixed exchange rate can break links with foreign interest rates and thereby pursue a more independent monetary policy. Similarly, free capital mobility reconciles with a floating exchange rate to facilitate the pursuit of an effective monetary policy. Monetary policy is ineffective where there is free capital mobility and fixed exchange rate, since interventions to curtail the exchange rate parity may offset the monetary policy and alter domestic interest rates.

It implies, therefore, that the pursuit of a particular macroeconomic goal depends on socio-political factors of an economy and the relative importance of some policy targets over others.

Judging from SSA's weak institutions and shallow financial sector, there is the need to examine these issues within the context of the growing interest in African countries.

1.2 Statement of the Problem

The increasing level of financial globalization and incidence of financial crises in recent times has drawn the attention of economists and policymakers to the macroeconomic implications of unrestricted capital flows. Although neoclassical theory predicts potential benefits of financial integration, empirical evidence of the real benefits on long term macroeconomic growth still remains highly controversial (Prasad et al., 2003).

Capital flows maybe ordinarily beneficial for receiving countries as they gain access to cheaper sources of financing. At the same time, they increase a country's vulnerability to international financial crises which occurs during spontaneous reversals in international capital flows. The financial crisis of the 1980s, Latin America and East Asia in the 1990s and Argentina in 2001-02, are examples of the disruptive effects of fluctuations in international capital flows (Chen and Quang, 2012). Although the financial turmoil in the United States of America (U.S.A.) and some parts of the Euro Zone may have been triggered by various issues such as bank failures, property bubbles and government fiscal deficit, the crises have been transmitted to other countries through financial channels. The crises in these supposed- resilient advanced economies have exposed the vulnerability of emerging economies that depend on foreign inflows and the global financial system as a whole.

Portfolio equity inflows to the Sub-Saharan African region have improved significantly over the last decade, which is an indication of the sub-region's gradual integration into the global financial market. Countries such as Ghana, Nigeria, Kenya, Zambia, Angola, Senegal, Tanzania, Cote d'Ivoire and South Africa have tapped in global capital markets in recent years (IMF, 2011 and 2013). Some countries have issued sovereign bonds to source for financing on the international capital market while others have attracted significant portfolio inflows. For instance, Ghana and Nigeria in 2007 issued sovereign bonds to raise a total of US\$950 million and US\$525 million respectively (IMF, 2011). Similarly, Senegal in 2009 raised US\$200 million from a sovereign bond issue; just as Zambia also raised US\$750 million in a similar issue (IMF, 2011 and 2013).

The search for high yield among international investors has led to new inflows of portfolio equity into countries with solid growth prospects such as Kenya, Nigeria and Uganda, thereby boosting activities on their stock markets (IMF, 2013).

These notwithstanding, excessive capital inflows into SSA might pose critical problems as they may counter domestic monetary and exchange rate policies. Problems such as asset price bubbles and sudden reversals of these inflows due a shift in investor risk appetite may also have severe consequences on the economic prospects of SSA countries; as we witnessed in Mauritius and Nigeria between 2007 and 2009 during the global financial crisis. Other critical issues that may arise from the unregulated capital flows in the Sub-Saharan African region are capital flight, contagion and macroeconomic volatilities (specifically, consumption and output volatilities).

In view of these pressures, the International Monetary Fund (IMF) in 2005 endorsed the legitimate use of temporary capital controls as part of a policy toolkit to help countries manage the large inflows of capital into their economies. The IMF, although is an advocate of international finance, acknowledges that greater financial globalization if not monitored can result in adverse effects for the global economy (Chen and Quang, 2012).

Consequently, recent studies by Mougani (2012) and Ahmed (2011) have found it necessary to investigate the extent to which the Sub-Saharan African region if integrated into the global economy by focusing on private capital flows and rule-based measures of financial openness respectively. As a matter of fact, the studies by Mougani (2012) and Ahmed (2011) arrived at no definite conclusion on the relationship between financial integration and economic growth in the SSA region, hence the need for further investigations.

However, to the best our knowledge, there is no empirical study analyzing the relationship between portfolio equity flows and economic growth in the financial globalization context in Sub-Saharan Africa. The current study proposes to empirically examine the effect of financial integration on economic growth in Sub-Saharan Africa

with concentration on portfolio equity flows over the period 1996-2010. The main point of departure of the current study from previous studies in SSA is the use of portfolio equity flows as a proxy for financial integration instead of private capital flows.

A critical look at the composition of private capital flows into developing countries reveals that foreign direct investment (FDI) constitutes the least volatile, given their long-term and relatively fixed nature (Prasad et al, 2003). Portfolio flows, on the other hand, tend to be more volatile and prone to spontaneous reversals. Given the relatively volatile nature of portfolio flows, it is worthwhile to examine the impact of portfolio flows on economic growth instead of private capital flows which is predominantly made up of FDI in some countries.

Similarly, the recent surge in portfolio equity to SSA is not evenly distributed as some countries receive significant amount while others are sidelined. It is therefore imperative to also investigate the driving forces behind the direction of portfolio equity flows in the sub-region.

1.3 Research Questions and hypothesis

In line with the problem statement, the study seeks to address the following related questions:

- What is the impact of Portfolio equity flows on Economic Growth in Sub-Saharan Africa?
- What are the determinants of portfolio equity flows in Sub-Saharan Africa?

The study also seeks to test the following hypothesis:

Ho: Portfolio equity flows have no robust relationship with economic growth in Sub-Saharan Africa.

Ha: Portfolio equity flows have a robust relationship with economic growth in Sub-Saharan Africa.

1.4 Objectives of the Study

The broad objective of the study is to investigate the impact of financial integration on economic growth in Sub-Saharan Africa.

The specific objectives of the study are:

- To examine the impact of Portfolio equity flows on Economic Growth in Sub-Saharan Africa.
- To investigate the determinants of portfolio equity flows in Sub-Saharan Africa.

1.5 Significance of the Study

The study is intended to contribute to empirical literature in this area of study since few works have been done on the subject of financial integration and growth in Sub-Saharan Africa.

The results of the study will also inform policy makers on the extent to which Sub-Saharan Africa is financially integrated into the global financial markets, and also help them to know the appropriate policies to implement to reduce their vulnerability to financial crises.

1.6 The Organization of the Study

The rest of the chapters of the study are organized as follows: Chapter two reviews related and relevant literature on the topic area; Chapter three gives an overview of recent developments in the Sub-Saharan African region; Chapter four explains the methodology used to analyze the panel data set; Chapter five reports the results of the data analysis and discussion; Chapter six concludes and summarizes the findings of the study and makes recommendations for policymakers.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter of the study reviews both theoretical and empirical works on the impact of financial integration on economic growth. This chapter will also review literature on the determinants of portfolio equity flows.

2.2. Definition of Concepts

Although there is no universal definition of financial integration, literature suggests that it is basically concerned with the movement of capital across national borders. According to Prasad et al. (2003) financial integration refers to an individual country's linkages to the international capital markets. That is, the extent to which a country's capital market is connected to that of other countries and the international community as a whole. Prasad et al also refer to financial globalization as an aggregate concept that is concerned with the increasing global linkages created through cross-border financial flows. Thus, financial globalization is the extent to which the individual levels of financial integration is growing or expanding over time. Their definition lies within the context of the existence of legal restrictions or other country-specific factors (be it institutional, governance or macroeconomic) which may promote or retard capital flows across borders. From the definition provided above, it is obvious that these two concepts are closely related. For instance, increasing financial globalization in essence implies that there has been improvement in the degree of financial integration worldwide. For this reason the terms financial integration and financial globalization are used interchangeably in some literature.

Theoretically, the concept of financial integration is an extension of the McKinnon-Shaw Hypothesis of financial liberalization. McKinnon (1973) and Shaw (1973) argue that financial repression exerts an adverse impact on savings, investment and the rate of economic growth as the government in that instance dictates key decisions in the financial market. Consequently, the McKinnon-Shaw hypothesis posits that the elimination of credit ceilings and restrictions by the government results in positive real interest rates which increases savings, thereby making funds available for investment and economic growth. The concept of financial integration comes about when the domestic financial market is liberalized to allow foreigners to partake in activities on the domestic financial market. In other words, the issue of financial integration arise when government removes barriers on capital mobility so it does not discriminate against foreign creditors in the domestic financial market. Investors therefore tend to have confidence that they can venture into new economies as they seek for higher returns on their investments.

Baele et al. (2004) define financial integration on the basis of the law of one price. The law of one price states that if assets have identical risks and returns, then they should be priced identically regardless of where they are transacted. They suggest that financial integration should be defined on the substance of three relevant characteristics. Thus, the market for a given set of financial instruments or services is deemed fully integrated if all market participants with similar attributes

- (i) are confronted with a single set of rules when they decide to trade in those financial instruments;
- (ii) have equal access to the set of financial instruments or services;
- (iii) are not discriminated against in the market.

In other words, they assert that the concept of financial integration is independent of the level of financial development or structures within regions.

Also, Baele et al. (2004) propose that full integration should involve equal access to banks, trading, clearing and settlement platforms for both investors and firms regardless of their region of origin or location in the global economy. Additionally, once access has been granted, full integration requires that there is no discrimination of any sort among market participants.

Yabara (2012) like Baele et al. (2004) also define financial integration in the context of the law of one price. He asserts that in perfectly integrated financial markets with no restrictions on cross-border transactions, returns on identical assets should be equalized across countries, so long as there is no difference in country risks and exchange risk. He and other authors (Baltzer et al., 2008) believe that financial integration in this context can be achieved without necessarily unifying institutions or markets. For instance, the financial markets of the United States of America (U.S.A.) and the United Kingdom (U.K) are said to be highly integrated even though these market have different institutional and legal frameworks.

2.2.2 Common Frameworks for Measuring Financial Integration

Over the last three decades, various measures have been employed to measure the degree of financial integration that has taken place. In a broader sense, the measures of financial integration can be categorized on the basis of the context in which financial integration is defined. In the context of the law of one price, there are two (2) types of measures of financial integration, namely *price-based measures* and *news-based measures* (Baele et al, 2004). Similarly, in the context of capital flows or mobility, there are two (2)

classifications of measures of financial integration, namely *dejure-measures* and *defacto-measures* (Edison et al, 2002).

Price-based Measures

The price-based measures seek to measure discrepancies in prices or returns on assets which may be caused by geographical origins of the assets. This in essence constitutes a direct verification of the law of one price, which implies that financial integration is complete if assets with identical characteristics are priced equally (Baele et al, 2004). These measures are based on direct asset prices or rates of return (yield) comparison and also take into consideration systematic (non-diversifiable) risk factors and other crucial characteristics. Typical examples of price-based measures of financial integration are cross-sectional dispersion of interest rate spreads or asset return differentials, sigma-convergence and beta-convergence. Another important price-based measure is degree of variability in cross-border price or yield relative to the variability within a specific country.

News-based Measures

The News-based measures are basically designed to differentiate information effects from other frictions or barriers. They are based on the premise that in a financially integrated area, portfolio diversification reflects all available information in the system. Therefore any new economic information from that particular area has little or no impact on asset prices since all such possible outcomes have been factored in the price. On the other hand, common or global news should be of relatively more importance since they might contain material information that has the potential of distorting prices in the area. Baele et al (2004) argue that the price movements of benchmark asset are good indicators of common news. For instance, the 10-year German government bond yield is

a good benchmark since it reacts mainly to common news in the Euro area instead of purely German factors.

Dejure Measures

These measures of financial integration seek to measure the presence or absence of government restrictions on capitals flows in an economy. That is, legal restrictions or controls that tend to impede cross-border capital flows. The most common used proxy of capital controls is the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) (Edison et al, 2002). The IMF on an annual basis publishes a report on the level of restrictions a country imposes on financial transactions with the rest of the world. The IMF's AREAER is often expressed in a binary (0/1) measure of capital account openness, where 1 represents the presence of legal restrictions and 0, otherwise. Although the dejure measure is an official measure of capital controls and restrictions, it is least preferred due to its shortcomings (Kose et al, 2009).

First, they do not reflect the exact degree of capital account openness because they are partially based on foreign exchange transactions that may not essentially obstruct capital flows. Second, they fail to capture the degree or the level of effectiveness of the capital controls and therefore regarded to be subjective in nature. Third, these measures do not consistently reflect the actual degree of an economy's integration into the international capital market. For instance, although China retains extensive controls on capital flows, it has not been able to curb inflows of speculative capital in recent times (WB, 2010). Other examples of dejure measures of financial integration are the Chinn-Ito Index, Quinn measure and the recently constructed Shindle Index.

Defacto Measures

Defacto measures of financial integration measure the actual quantity or value of capital that flows across borders. These measures of openness appear to be the best available measure of financial openness and have been used extensively in recent empirical studies. The choice of the particular defacto measure of openness one chooses to use depends on the precise question one is interested in. Gross flows (the sum of total inflows and total outflows) in general are less volatile and provide a more insightful picture of integration as it captures two-way flows (Kose et al., 2009). Other authors prefer the use of net flows (the difference between inflows and outflows). However, Kose et al. (2009) argue that annual gross flows tend to be more volatile and have measurement errors. To mitigate these problems, they suggest the use of the sum of gross stocks of foreign assets and liabilities as a ratio to GDP. These notwithstanding, defacto measures also have some drawbacks. For instance, Collins (2007) argues that defacto measures are most likely to be endogenous in growth regression, making the issue of causal relationship questionable. Example of defacto measures are stock of capital flows, stock of capital inflows, and net capital inflows or outflows.

While both the de jure and defacto measures are important, the defacto measures give a better picture of the extent of a country's integration into global financial markets. For many empirical studies this measure is more preferred (Edison et al., 2002).

2.2.3 Potential Benefits of Financial Integration

Theoretically, analytical arguments supporting financial integration revolve around both the direct and indirect channels through which financial openness can help foster growth in developing countries. Although these channels are related in one way or the other, it is important to identify the important contribution of each of them.

Direct Channels

Augmentation of Domestic Savings

Capital account liberalization helps the country at the receiving end of the capital flows to gain access to international pool of resources to complement domestic savings. This helps to increase the capital needed to undertake huge investment activities which ultimately promote growth. In many developing countries, the capacity to save is constrained by a low level of income. Insofar as the marginal return from investment is at least equivalent to the cost of capital, net foreign capital inflows can augment domestic savings, increase the levels of physical capital per worker, and promote growth (Agenor, 2003). It also helps to smoothen domestic consumption and production by allowing the country to borrow in “bad” times and lend in “good” times. Thus, Individual households and firms are able to sustain their consumption and production levels respectively through international capital flows leading to an improvement in the standard of living of the people and reduce macroeconomic volatility.

Reduction in Cost of Capital through Better Global Allocation of Risk

Financial globalization facilitates the mobility of capital from capital-abundant advanced economies where returns on capital are relatively low to capital-scarce developing economies where the rates of return are relatively high. Thus, the search for high rates of return on capital leads to the diversification of capital to developing economies. This increases the amount of capital available to domestic investors, thereby reduce the cost of capital and further reduce equity risk premium through opportunities to diversify investment internationally.

Transfer of technology and Managerial Know-How

When substantial amount of capital flows into a country, especially if it takes the form of foreign direct investment (FDI), it is usually accompanied by technology and managerial expertise. These managerial and technological spillovers tend to introduce innovative ideas and techniques of solving problems in industrial settings, which eventually raises aggregate productivity and boosts economic growth. Typical examples are the exploration techniques and technology employed in the mining and energy sectors of industry.

Stimulation of Domestic Financial Sector Development

Another important argument for financial globalizations is its potential to induce the development of domestic financial sector. Substantial inflows of portfolio equity into the financial system tend to increase the depth and width (liquidity) of the financial market. FDI in the banking sector enables foreign banks to participate in the banking industry, whose entry brings about competition, efficiency and improved access to the financial intermediation process (Prasad et al., 2003 and Agenor, 2003). Thus foreign participation in the domestic financial system increases efficiency by lowering costs and supernormal profits associated with monopolistic or cartelized markets. Foreign banks can help better the regulatory and supervisory framework of the domestic banking sector. They do these by pushing for the implementation of internationally accepted best-practices in the banking and finance industry. A typical example is the implementation of the International Financial Reporting Standards (IFRS).

Financial globalization exposes the domestic financial system to various financial instruments, products and services used on the global capital market. These products and services may also be introduced by the foreign banks in the domestic economy to

facilitate their transactions with multinational corporations. Typical examples are the introduction of custodian and nominee services in the investment banking industry of developing countries.

Indirect Channels

Promotion of specialization

Since capital account liberalization offers countries the opportunity to tap into international pool of funds to smoothing consumption and production, they tend to specialize in the production of goods and services where they have comparative advantage over other countries. This therefore boosts aggregate production and economic growth (Prasad et al., 2003).

Enhanced macroeconomic discipline

Literature suggests capital account liberalization can yield its potential benefits only under prudent macroeconomic management and other threshold factors. This puts pressure on the government to follow more disciplined macroeconomic policies and reduce policy mistakes (Gourinchas and Jeanne, 2003, and Obstfeld, 1998). Also potential costs such as financial crisis and macroeconomic volatility keeps the government in check, thereby leading to prudent economic management and its associated growth. Furthermore, financial integration serves as a signal to the international community that a country is willing to adopt and implement sound macroeconomic policies such as reducing government budget deficits and eliminating inflation tax (financial loss of value on cash and other financial assets due to the effects inflation).

2.2.4 Potential Cost and Concerns

Concentration of capital flows and lack of access

Empirical evidence of capital account liberalization over the past two decades has shown that the surge in cross-border capital flows tends to be highly concentrated to a small number of recipient countries (Agenor, 2003). For instance, the share of total private capital flows to developing countries fell significantly during the 1990s while a significant share of the capital flows went to the top 10 economies in the world. The implication is that a sizeable number of developing countries may be 'rationed out' of the international capital market notwithstanding the extent to which their capital account is opened.

Macroeconomic Instability

Large capital inflows stimulated by financial globalization can result in macroeconomic problems such as rapid monetary expansion, inflationary pressures, real exchange rate appreciation and current account deficits (Obstfeld & Taylor, 2003; and Agenor, 2003). For instance, excessive capital inflows will lead to an appreciation of the local currency relative to the international trading currency thereby making exports expensive relative to imports. The result will be a reduction in exports and an increase in imports culminating in balance of trade problems. Also under a flexible exchange rate regime, rising external deficits tend to cause currency depreciation, which may eventually lead to an adjustment of relative prices and induce self-correcting movements in trade flows (Agenor, 2003).

Herding, Contagion and Volatility of Capital flows

A high degree of financial integration may facilitate volatility in capital flows which can ultimately result in financial crisis. This is the mostly likely situation in times of large reversals in short-term capital flows associated with speculative activities. This act of investors mimicking each other's actions, sometimes ignoring socially vital information is known as Herding. These sharp reversals tend to disrupt investment activities and leave the financial market in disarray. Similarly, investors may also withdraw their portfolio flows following the slightest hint of information from other parts of the world. They usually do this to avoid losses and mitigate their risk.

Capital flight

Poor economic management and unfavourable macroeconomic policies in instances of high degree of financial openness can result in capital flight. Capital flight occurs when financial assets or capital rapidly flow out of a country due to events in the domestic economy. For instance, an increase in capital gains tax or inflation may result in large movements of short-term portfolios to economies with favourable investment climate. Domestic portfolio equity may also flow with ease to other economies where the rates of return on equity are high at the expense of the domestic financial market, reducing its depth and liquidity.

2.3 Empirical Review

Issues concerning International Financial Integration (IFI) have gained prominence in economic discussions following the financial crises in the 1990s. Many academic studies have tried to establish the relationship between IFI and economic growth by incorporating a proxy for IFI into the classical growth model. However, the results have

been mixed since some studies find a positive relationship between IFI and growth, while others prove otherwise. This section presents some of the works that support a positive relationship between IFI and economic growth and some of the studies that contradict this assertion.

2.3.1 Studies Implying a Positive Relationship between International Financial Integration and Economic Growth

The standard open economy neoclassical-Solow model provides the foremost and lasting argument for capital account liberalization and financial integration (La Marca, 2004). Thus, under financial openness, real interest rate differential between capital-abundant countries and capital-scarce countries would lead to the flow of funds to the capital-scarce countries as foreign savings needed for investment and growth. Financial integration will cause the natural flow of funds from the capital-abundant developed economies to the capital-scarce developing economies which would ultimately lead to an “unconditional” convergence in portfolio (asset) returns, capital intensity, technology and per capita incomes.

Bailliu (2000) examines private capital flows and economic growth in developing countries using a dynamic panel-data methodology for a cross-section of 40 countries from 1975-95. The results of the study suggests that capital inflows foster economic growth beyond any effect on investment rate but only for countries that have some level of financial development. However, she observes that capital flows adversely affects growth in countries with poorly developed banking sectors.

Summers (2000) in his analysis of the causes, prevention and cures of the financial crises in the 1990s suggests that, capital market development should be given high priority in

the process of domestic and international capital-market liberalization. This, he believes is a proven strategy for promoting economic efficiency and growth.

Similarly, Quinn et al., (2001) use a cross-section of 58 countries to investigate the relationship between capital account liberalization and economic growth. Their study confirms the assertion that, capital account liberalization has a direct effect on economic growth for advanced industrial democracies but not for emerging market democracies. They identify that capital account liberalization in emerging market democracies without some form of welfare state, particularly political, legal, social and economic conditions may result in diminished growth. They also find that benefits of capital account liberalization are highest in advanced democracies, moderate in transitional polities but very negligible in developing democracies.

In a related work, Klein and Olivei (2006) investigate the effects of capital account liberalization on financial development and economic growth for a cross-section of countries over the period 1986-1995. They identify that countries with capital account openness gained higher degrees of financial development than countries with capital account controls. Their findings is in agreement with earlier results by Quinn et al (2001) that capital account liberalization yields more benefits to advanced countries than the developing countries. Klein and Olivei(2006) conclude by suggesting that developing economies should consider capital account liberalization after putting in place adequate institutions and sound macroeconomic policies to avoid capital flight.

In a more recent study by Sedik and Sun (2012), they analyze the short-to-medium term effects of liberalizing capital flows on macroeconomic performance and risks to financial stability for a sample of 37 emerging market economies (EMEs) over the period 1995-2010. They go further to analyze the position of China in the same context as the other 37 EMEs. They proxy financial openness with two new de jure measures although the

restrictiveness indices are based on the IMF's AREAER. The first restrictiveness index is similar to the Schindler index (Schindler, 2009) and comprises 21 categories of restrictions, including restrictions on equity, bond, money market and collective investment scheme instruments, financial credit and direct investment by direction. They use the second de jure index as a robustness check and this is an average of binary indicators of 62 categories of capital transactions. It includes items such as all capital transactions, foreign exchange and domestic currency accounts of residents and non-residents, regulatory measures related to the financial sector and repatriation and surrender requirements. Following literature, Sedik and Sun employ the system GMM methodology to analyze the effects of capital account liberalization on the EMEs. The evidence from the data supports the argument that financial openness can explain macroeconomic performance and financial stability risks, at least partially. Specifically, the paper finds evidence that capital account liberalization is associated with higher GDP per capita growth and lower inflation. Also, financial integration is found to be associated with higher returns on equity and lower bank capital adequacy ratios thereby suggesting potential risks to financial stability in events of spontaneous reversals in capital flows.

The outcome of the analysis on China is not very different from that of the other EMEs on qualitative terms. However, they argue that quantitatively, the effects depend on the pace and sequencing of financial openness. Furthermore, they suggest that future research should be directed at employing a different econometric approach to the Chinese situation due to its size and ongoing structural changes which is quite unique from the other EMEs.

2.3.2 Studies rejecting the existence of a Positive Relationship between International Financial Integration and Economic Growth

Grilli and Milesi-Ferretti (1995) study the effects and determinants of capital controls in a cross-section of about 58 countries using a combination of ordinary least squares (OLS) and weighted least squares (WLS) methods. They observe that capital controls, current account restrictions and the use of various currencies are associated with higher inflation rates and lower real interest rates. They also find that a capital account controls have no correlation with economic growth.

Kraay (1998) investigates the effects of capital account liberalization on macroeconomic determinants for a cross-section of countries made up of developed and developing economies. He acknowledges the benefits of capital account liberalization as noted in economic literature. However, he finds that the existing measures of capital account liberalization are poor and the data set suggests that capital account liberalization has negligible or no impact on growth, investment and inflation.

In a related work, Rodrik (1998) analyzes the impact of capital account liberalization on growth for a sample of about 100 countries including both developed and developing countries from 1975-89. His study fails to control for other determinants of growth; but, finds that there is no evidence in the data that capital account liberalization has significantly promoted investment and economic growth and reduced inflation. He observes that financial crises cannot be eliminated but a domestic financial market can reduce its risk by adopting appropriate macroeconomic policies and financial standards.

In a similar work, Edwards (2001) inquiries into the effects of capital mobility on economic growth using a cross-country data of 61 countries from 1981-1990. Edwards (2001) is of the view that positive relationship between capital account openness will be

evident after the attainment of a certain level of development. Edwards (2001) concludes that capital account openness in an economy with a low level of financial development may have a negative effect on economic growth.

Edison et al., (2002) examine the relationship between IFI and economic growth data over 20-25 years for 57 countries. They construct a variety of measures of IFI and conclude that, the dataset does not support the view that IFI promotes economic growth after controlling for specific economic, financial, institutional and policy characteristics. However, they note that IFI is positively associated with real per capital.

Table 2.1 Summary of Research on Financial Integration

Economic Growth Study	No. of Countries	Years Covered	Effect on Growth
Edwards (2001)	62	1980s	No effect for poor countries
Edison, Levine, Ricci, and Slok (2002)	57	1980–2000	No effect
Sy(2006)	8	1996–2003	Mixed
Schularick and Steger (2006)	24	1880–1913	No effect
Afzal (2007)	Pakistan	1960–2006	Co integrated
Osada and Saito(2010)	83	1974–2007	Mixed
Ahmed (2011)	25	1976–2008	No robust effect
Sedik and Sun (2012)	37	1995–2010	Positive
Mougani (2012)	SSA	1976–2009	Mixed
Chen and Quang (2012)	80	1984–2007	Mixed

Sources: Author's compilation.

2.3.3 Literature implying mixed or no relationship between IFI and growth

Obstfeld and Taylor (2003) study the evolution of the degree of international capital mobility over the last 100-plus years for a cross-section of advanced countries. Although they acknowledge the potential benefits of capital account liberalization, they are quick to raise concerns on its implications for macroeconomic policies. Their concern is in relation with the macroeconomic policy “trilemma” which posits that at best two policy goals (full freedom of cross-border capital movements, a fixed exchange rate and an independent monetary policy oriented towards domestic objectives) can be achieved concurrently. Obstfeld and Taylor explain this position in three scenarios:

- (i) If capital mobility is restricted, domestic fixed exchange rate can break links with foreign interest rates and thereby enhancing the domestic country’s ability to pursue a more independent monetary policy.
- (ii) Free capital mobility best reconciles with a floating exchange rate to facilitate the pursuit of an effective monetary policy. Monetary policy is ineffective where there is free capital mobility and fixed exchange rate, since interventions to curtail the exchange rate parity may offset the monetary policy and alter domestic interest rates.
- (iii) When exchange rate is fixed and there is a liberalization of the capital accounts, monetary policy becomes ineffective since actions to curtail the exchange rate parity will involve capital flows, which will definitely counter any monetary policy action.

This conflict among rival policy choices is the core of their study of the historical evolution of world capital markets. They empirically investigate the path of global capital movements by using three different (3) criteria namely; gross stocks of foreign capital, real interest rate convergence and exchange-risk-free nominal interest parity. On

the basis of gross stocks foreign capital, they find that the data is consistent with literature on the idea that the nature of the evolution of international capital mobility from the late nineteenth century. In the context of real interest rate convergence, Obstfeld and Taylor use long-term real interest rate data constructed from the Global Financial Database to arrive at the conclusion that real interest rates have been co-integrated over time in advanced countries where interest rate differentials are relatively stable. This is consistent with other literature that supports the view that international real interest rates tend to converge over long periods of time (Fujii and Chinn, 2000). On the basis of exchange rate parity, they analyze the degree of international financial integration using monthly data on forward exchange rates, spot rates and nominal interest rates for 1921 through 2001 to calculate the return on interest rate arbitrage between countries. The findings indicate that exchange rate differentials are relatively small and stable during the pre-1941 gold standard, diminish slightly in the late 1920s. The differentials then widen through the late 1960s and ultimately diminish around the 1980s. This trend they believe is in conformity to the others indicators that explain the evolution of capital mobility over the past century.

In a contemporary study on financial integration in the West African Economic and Monetary Union (WAEMU), Sy (2006) uses price-based measures of financial openness to assess the degree of financial integration in the WAEMU. He believes the concept of financial integration is closely linked to the “law of one price”, which states that if assets have identical characteristics such as risks and returns, they should be priced identically regardless of where they are traded. However, in practice, the law of one price can only be tested on instruments that are listed or quoted. Due to limitations, Sy acknowledges this fact and goes on to use bank interest rate spreads instead of stock or bond market prices. The study asserts that bank interest rate levels are reflective of both

macroeconomic and microeconomic conditions. The macroeconomic conditions include market interest rate levels whilst the microeconomic condition bear on the banks' pricing mechanism and market share or power. He argues that, the convergence of these spreads could be an indication of greater integration while a decline in the levels can be a signal of increased competition.

Borrowing from the methodology of Adam et al (2002), the study estimates two measures of financial integration: (1) sigma-convergence and (2) beta-convergence. Sigma-convergence measures the degree of integration. That is, the extent to which the markets are already integrated. To estimate this, he builds a time series of cross-sectional dispersion in bank lending interest rates. Beta-Convergence on the other hand measures the speed of convergence. Thus, it measures whether or not banks' spreads in countries with relatively high spread have a tendency to decrease more sharply than in countries with relatively low spreads. The result of his analysis points to the conclusion that convergence on the basis of sigma-convergence has been decreasing.

Schularick and Steger (2006) also investigate whether international financial openness fostered growth in the first era of global finance using a contemporary dataset for 24 developing and developed countries over the period 1880-1914. In order to obtain fully comparative results with contemporary studies, they use econometric models that are consistent with recent literature. Borrowing the methodology of Edison et al (2002), they run identical growth regression on both the contemporary data (1980-2002) and the freshly assembled dataset for the first era of global finance (1880-1913).

The findings of the study are observed to be in stark contrast with the mixed evidence in the contemporary period. Specifically, the historical period gives an unambiguous relationship between financial integration and growth in all the three regressions

specification. This lends support to the idea of a robust relationship between financial openness and growth in the first era of financial globalization. Schularick and Steger argue that, the direct contrast between the historical period and the post-World War 2 period was as a result of the combination of two key factors: (i) Enormous investment opportunities abounded in regions where financial funds were scarce. (ii) There was a relatively stable monetary environment and a favourable institutional setting thereby providing the prerequisites for the textbook model to work more appropriately. These factors together facilitated substantial net capital flows from the rich core countries to the poor periphery economies. Furthermore, they emphasize the need for countries to abolish domestic distortions and establish good property rights before participating in the world economy. This they believe is a straight-forward application and reinforces the significance of the well-known second-best theorem.

Afzal (2007) examines the impact of globalization on the economic growth of Pakistan over the period 1960-2006. Afzal (2007) uses a stock of capital flows (ratio of the sum of capital inflows and capital outflows to GDP) as a proxy for financial integration and the ratio of the sum of imports and exports to GDP to measure international interdependence (trade openness). Using the Johansen approach to cointegration analysis, he observes that financial integration and trade openness are co-integrated, implying that they have a long run relationship with economic growth. Similarly, the results from Afzal (2007) Error-correction model support the co-integration outcome. The study suggests that, for the given dataset financial integration and trade openness do not have short-run effects on economic growth. However, they tend to have a long –run relationship with economic growth. The outcome of Afzal (2007) supports the view that public sector investment and human resource development are very instrumental in fostering economic growth.

In a related study by Osada and Saito (2010), they study the effects of financial integration on economic growth using a comprehensive panel dataset of 83 international countries from 1974-2007. The study uses defacto measures of financial integration broadly categorized as stocks of external assets and liabilities. In order to identify the type of external assets or liabilities that have a relatively large impact on economic growth, Osada and Saito (2010), break down the stock of external assets and liabilities into four categories, namely; (i) FDI liabilities and equity liabilities, (ii) debt liabilities, (iii) FDI assets and equity assets and (iv) debt assets.

Following Kose, Prasad and Taylor (2009), the study employs the system GMM method to estimate the effects of the various measures of financial openness on economic growth, while controlling for other variables that influence economic growth such as population growth, years of schooling, inflation rate, trade openness and institutional quality. The findings of their study suggest that the effects of financial openness on economic growth vary substantially depending on the type of external assets and liabilities. Specifically, in the context of external liabilities, FDI and equity liabilities tend to have a positive influence on recipient countries, although debt liabilities tend to have a negative impact on economic growth. Their arguments tend to confirm the earlier empirical evidence by Kose, Prasad and Taylor (2009). In the context of external assets, both FDI and equity assets and debt assets were found not to have contributed meaningfully to economic growth. The justification Osada and Saito (2010) gave for this outcome was that, an increase in external assets may lead to a relocation of production units from the country that owns those assets to other countries. Consequently, domestic production will decline and this decline will offset the growth benefits from other economic variables. Furthermore, Osada and Saito (2010) sought to find out whether the effects of financial integration are different for countries considering their characteristics.

In doing this, they categorize the 83 countries into two groups that they refer to as “high group” and the “low group” on the basis of historical averages of the characteristic variables (inflation rate and years of schooling) over the period of study. Their evidence suggests that FDI and equity liabilities have a positive and significant effect on economic growth in countries with higher initial per capita GDP, higher level of human capital, developed domestic financial markets, larger trade openness, quality institutions and lower rates of inflation. Again, this evidence confirms the earlier findings by Kose et al (2006) concerning the need for a certain level of threshold conditions to be achieved for an economy to make any substantial gains from financial integration. The study therefore asserts that countries with developed domestic financial systems tend to use external funds more effectively. On the whole, they conclude that countries with better institutions and developed financial systems are more likely to reap benefits from increasing FDI and equity liabilities.

In a contemporary empirical study covering a cross-section of 25 Sub-Saharan countries from 1976 through 2008, Ahmed (2011) provide evidence that do not support the view that financial integration promotes economic growth in Sub-Saharan Africa. Following Edison et al (2002) and Lane and Milesi-Ferretti (2007), the work uses both the de jure measure as measured by the IMF’s Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) and defacto measures (aggregate stock of external asset and liabilities to GDP) as proxy for financial openness and employs the Generalized Method of Moments (GMM) approach for his panel data analysis. Although the coefficients of his indicators of financial openness are positive in most cases, he finds no robust link between financial openness and economic growth. Ahmed, however, observes that financial integration has enhanced growth through indirect channels such as facilitating the development of domestic financial markets and products.

Ahmed (2011) also agrees with other strand of literature that, good governance and institutions, lower government spending and a relatively stable macroeconomic environment are very instrumental in mitigating the adverse effects of financial globalization.

Similarly, Frey and Volz (2011) examine the effects of political agreements on regional financial integration (RFI) on financial market development in Sub-Saharan Africa. Following the approach of Chinn and Ito (2006), they use the simple linear regression analysis (ordinary least squares, OLS) method to analyze the relationship between financial development and financial openness for Sub-Saharan for the period 2004 through 2008. Frey and Volz measure financial openness with the Chinn-Ito-Index, which de jure measure calculated based on data from the IMF's AREAER. In line with Kose et al (2006b) their results suggest that, for a country to reap the benefits of financial integration, it must attain a certain level of the threshold conditions. For instance, they emphasize the need for countries with low institutional quality to relegate RFI until their institutional quality reaches a level likely to yield benefits for regional financial integration. This, Frey and Volz (2011) believe can have negative effects on the size of the financial sector. Furthermore, their study does not find any significant effect of RFI on the size and efficiency of both the banking sector and the stock markets. Frey and Volz (2011) admonish the need for sequencing of financial opening in order to attain beneficial outcomes and avoid adverse effects.

On the issue of regional financial integration and access to finance in SSA, Frey and Volz (2011) do a ground-breaking study by investigating the effects of RFI on firms' access to finance.

For small enterprises, they provide evidence in support of the notion that RFI tend to impact negatively on the access to finance for small enterprises. On the other hand, they find no significant effect of RFI on access to finance for large enterprises or all enterprises as an aggregate. Furthermore, they observe that regional financial integration reduces the cost of financing for both small and large enterprises. However, they are quick to comment that the cost reduction benefit is enjoyed by a fraction of small enterprises due to the problem of credit rationing. Nonetheless, the study was constrained by problems of data availability, most notably, the lack of data on bilateral capital flows warranted the use of de jure measure of financial openness which is relatively subjective.

2.3.4 Determinants of Cross-Border Portfolio Equity Flows

Cross-border portfolio equity flows have increased tremendously over the last two decades, characterized by significant flows from advanced economies to emerging market economies (EMEs). Literature provides varied explanations for this downward trend in the flow of portfolio equity to EMEs. Theoretically, Portes and Rey (1999) identify that cross-border portfolio equity flows can be explained from two perspectives, namely; from the finance perspective on portfolio composition and from the perspective of international macroeconomics and trade.

The financial perspective focuses on portfolio adjustment, information and the relationship between flows and returns. However, the scope of the discussion in this study is limited to the international macroeconomic and trade perspective of portfolio equity flows.

The study analysis the determinants of portfolio equity flows in the context of the Supply-leading and Demand-following hypothesis pioneered by Patrick (1966). Patrick's Supply-leading and demand following finance hypothesis posits that, financial

institutions and its associated services should be put in place and made available well in advance of demand for them. He explains further that, the introduction of new and improved services and financial instruments will entice the public to demand these financial services and lead to the reconstitution of wealth portfolios in favour of financial assets. Consequently, financial development will facilitate gross capital formation through the provision of incentives for savings and investment.

Similarly, the portfolio equity is expected to flow into economies where the necessary conditions and environment have been created to attract such inflows. The rest of this chapter discusses some of the macroeconomic factors that explain the cross-border movement of portfolio equity.

Capital Controls

The official position of a government on its cross-border capital control policy to a greater extent influences the quantity and the composition of capital that flows into the economy. Literature suggests that an economy with a more liberal policy on capital control is more likely to experience free movement of capital across its borders than an economy with a conservative policy on cross-border capital control. Literature suggests that a country's policy on capital control is often measured by a *de jure* indicator usually reported in the IMF's AREAER (Vo, 2005). Lane and Milesi-Ferretti (2008) find that financial innovation and capital account liberalization in Europe have been important factors in accelerating cross-border financial trade among the advanced countries. Similarly, Prasad et al. (2003) also identifies that capital account liberalization is a pre-requisite for greater international financial integration since impediments to cross-border flows are eliminated.

However, evidence from some Latin American countries suggests that capital controls may not be always effective in restricting actual capital flows across international

borders. For instance, the financial crisis that occurred in Mexico and Argentina during the 1970s and 1980s were characterized by episodes of capital flight. Again, some developing countries especially in Africa have few capital restrictions but have witnessed a minimal amount of capital flows (Prasad et al., 2003). The direct opposite is the situation in China and India who until recently had very conservative capital control policies but still experienced significant cross-border capital flows (IAB, 2010 and Sedik and Sun, 2012). China and India are however implementing policies to facilitate their gradual liberalization of their capital accounts to reap the full benefits of financial globalization.

Level of economic development and rate of return on investment

Literature suggests that the level of economic development in a country plays a significant role in attracting portfolio equity into that economy. Edison et al. (2002) and Prasad et al. (2003) argue that rich and advanced economies tend to be well educated and highly integrated into the global financial market than poor or least developed countries (LDCs). Developed economies also tend to have better economic growth prospects than LDCs, so investors prefer to invest in developed economies where rate of return on investment may be higher.

However, recent studies suggest that some LDCs are showing better growth prospects than the developed countries in the wake of shocks in the global economy. For instance, IMF (2012 and 2013) report that the SSA region is growing at a rate of about 5 percent (%) per annum well above the global economic growth rate of 2.3 percent. The impressive growth rate of the SSA regions is believed to be a contributing factor to the recent surge in portfolio equity to the region.

Also the global search for higher rates of return will cause investor to drift towards countries with impressive and robust economic growth prospects where there might be

untapped investment potential (Bhaskaran et al., 2005). This has been the case over the last decades as portfolio equity flows to EMEs where growth prospects and investment returns seem higher relative to global economic growth rate.

Country Political, Institutional and Investment Environment

Another important determinant of cross-border portfolio equity flows is the nature of the political, institutional and investment environment of the recipient country. Literature on capital mobility and international financial integration propose that capital holders are more likely to invest in economies where there is relative political stability, rule of law and a relatively favourable business climate.

Countries with relatively stable democratic governments tend to attract more cross-border capital inflows than fragile countries since the investor community develop some level of confidence in the governance system. Capital holders believe the current state of peace and harmony would not be toppled any time soon, so their investments would be secured against any form of political risk. Also, relatively stable political economies tend to establish bilateral and international relations with other stable economies in the areas of trade, finance, technical and development assistance. Such forms of partnership encourage capital holders to explore for business opportunities abroad. Von Furstenberg (1998) observes that greater financial integration requires mutual confidence and a credible reputation to provide a firm basis for trust in cross-border financial trade.

A transparent judicial system and an effective regulatory and supervisory framework also go a long way to boost investor confidence and protect their interest. Portfolio equity is more likely to flow into economies where there is rule of law and the ability to exercise their property right. The ability to exercise property rights is very essential to the investor community since their property rights enable them to protect their investments and

repatriate their capital if the need arises. For instance, La Port et al. (1997) and Edison et al. (2002) note that the legal rights of investors and the extent to which the relevant laws are enforced are very important for cross-border capital mobility.

Effective regulation and supervision of all relevant institutions such as the stock markets, commercial banks, insurance companies, payment and settlement houses and professional accounting standards and reporting bodies are also very important in attracting portfolio equity flows. These institutions and their affiliates tend to be the recipients of portfolio equity flows and appropriate measures are required to monitor and regulate their activities in order to create bad reputation in the event of a stock market crash or bank runs. Portes and Rey (2005) like Bekaert (1995) acknowledge the poor information about the nature of institutions such as the stock markets, payment and system and account standards in the recipient country might discourage cross-border portfolio flows to the country.

Fiscal Position and local Tax Policy

The fiscal position of an economy gives much information to the international community about what they should expect in the near future. A budget deficit gives a signal that the government will spend in excess of its revenue position and will have to consider other means of financing its deficit. Budget deficit also gives a signal of a possible inflationary pressure on the economy.

The government may either consider domestic source such as increasing tax levies and issuing treasury bonds or foreign sources loans, grants, issuing sovereign bond and tapping into its international reserves. Whichever way the government chooses will ultimately have some adverse effects on the domestic economy. For instance, increasing tax levies will generally increase the cost of production and reduce profitability level of

businesses thereby discouraging investment. Similarly, an increase in capital gains tax will reduce the rate of return for investors. The quest for high yields on investment will cause investors to shift their portfolios asset to countries where the tax rate is relatively lower. Issuing treasury bonds will amount to crowding-out private businesses and lead to an increase in real interest rate. Private production reduces, leading to a decline in GDP and economic growth.

Sourcing for foreign loans and grants comes with its associated, often unfavourable terms and conditions. The government may also have to tax the populace in future to repay the loan. Issuing sovereign bonds may have the immediate effect of appreciating the local currency against the major trading currencies. Exports appear more expensive and imports are cheaper, so net foreign assets may decline. Furthermore, if the loan is used to pay salaries or remuneration instead of infrastructural or capital projects, the excess liquidity may put pressure on the monetary policy and might cause inflation. Inflation will also erode the value of returns on investment and cause capital flight. In the final analysis the government will have to tax the populace or borrow again to re-pay the maturing debts. Government tapping into its international reserves reduces its net foreign assets and is global competitiveness.

The reverse of the above scenario is true for government budget surplus. On the whole a government budget surplus and a lower national tax policy is like to attract portfolio equity flows than a budget deficit and a higher national tax policy insofar as international investors seek to diversify their portfolios to avoid taxes on investment returns (Lane and Milesi-Ferretti, 2003).

Financial Development

Literature on international financial integration and capital mobility suggest that financial development plays very significant role in cross-border capital flows (King and Levine, 1993; and Prasad et al, 2003). The proposition is that, countries with developed financial systems are more likely to attract huge portfolio equity flows than countries with under-developed financial systems. This is because developed financial markets are believed to have reputable banks that have the capacity manage and account for the huge portfolio equity left in their care. The reputable banks usually have their mother banks in advanced countries and have experienced bankers who have the expertise in managing investment portfolios to minimize risk.

Developed financial systems also have various financial instruments and products in which investors can buy into to diversify the risk of their portfolios. Developed financial systems are often able to effectively assess the risk profile of borrowers and smoothly implement the financial intermediation process at lower lending rates to reduce the incidence of non-performing loans. This builds some confidence in capital holders since their investments will effectively managed. Developed financial systems have effective supervisory and regulatory institutions such as the Securities and Exchange Commission, the Central bank, National Insurance Commission, and National Pensions Regulatory Authority that enact laws to regulate the activities of market players.

Developed stock markets with shorter and effective payment and settlement systems also play a vital role in attracting portfolio equity. Stock markets with high market indices send a good signal to investors about the good prospects of their investments. Higher volumes of trade, huge market capitalizations and shorter settlement periods inform potential investor about the liquidity, size and the ease with which one can undertake

investment activities (Arfaoui and Abaoub, 2010). This characteristic is very important for global investors who react swiftly to global economic developments.

Trade Openness

A country's trade relations with the international community also determine the extent to which portfolio equity flows into that country. According to Lane and Milesi-Ferretti (2003), international trade in goods results in the direct transfer of funds for the settlement of financial obligations. It subsequently leads to trade credit, transportation costs (freight and air fare) and export insurance (Vo, 2005). For instance, a local resident's desire to purchase (import) a factory machinery abroad may require the person to travel abroad to transact that business. When a deal is reached, the goods are paid for and other transport expense such as freight and cargo insurance are paid to ship the goods to its final destination. In the final analysis trade transactions will have caused capital to flow out of the domestic economy. The reverse is true for exports, where capital flows into the domestic economy due to the sale of goods and services abroad.

As stated by Obstfeld and Rogoff (2000), greater bilateral and international trade relations among countries create a solid foundation for cross-border transactions which will grow over time to form a strong basis for cross-border financial transactions and facilitate portfolio equity flows.

Deléchat et al. (2009) study the determinants of the allocation and composition of capital flows using a database covering 44 Sub-Saharan African countries over the period 2000-2007. They analyze the impact of key country characteristics in attracting different amounts and types of private capital. Following literature, Deléchat et al. (2009) use instrumental variables to address the issue of reverse causality and endogeneity associated with the measures of institutions. The study also uses the Chinn-Ito index,

which is based on the IMF's AREAER as a proxy for de jure measure of financial openness.

On the determinants side, they find that capital market development is closely associated with higher private capital inflows than basic property rights institutions. Thus, capital flows to SSA, specifically portfolio flows, have been concentrated in a relatively limited number of countries with relatively advanced financial markets. This, they believe maybe attributed of the increasing importance of portfolio and debt flows, relative to FDI as has been observed in SSA in recent times. This result supports the notion that, financial development is very crucial for capital flows than basic property right institutions. They also observe that while oil exporting countries in SSA tend to receive more FDI than the non-oil exporters, they do not have any particular advantage in terms of portfolio and debt inflows.

Concerning the effect of capital flows on growth in SSA, Deléchat et al observe that capital flows are positively and significantly associated with growth. However, they are quick to mention that their results are far from sufficient for making inferences about causality. They are therefore inconclusive about the impact of private capital flows on growth and recommend additional research before any definitive statement can be made.

CHAPTER THREE

OVERVIEW OF SELECTED MACROECONOMIC VARIABLES IN SUB-SAHARAN AFRICA

3.1 Introduction

This chapter of the study gives a brief description of the Sub-Saharan African region and the nature of economies in the region. This chapter also describes the trend and recent developments of specific macroeconomic variables that are relevant to the current study.

3.2 Nature of the Sub-Saharan African Region

Sub-Saharan Africa is a very diverse region, whether appraised on the basis of population, income levels, or the composition of output. For analytical purposes, IMF staffs have found it expedient to decompose the 45 countries into four sub-groups, namely, oil exporters, middle-income countries, fragile countries and non-fragile low-income countries (IMF, 2012).

- The Oil exporters are countries that have oil as one of its significant export commodities and that the evolution of world oil prices plays a key role in driving their economic developments. Countries in this group are Angola, Cameroon, Chad, Equatorial Guinea, Gabon, Nigeria and the Republic of Congo.
- The Middle-income status of a country is defined with reference to the World Bank's classification of economies on the basis of per capita income level and institutional quality. Occasionally, countries in this group can be further categorized into economies that have long been classified as middle-income and economies that have recently attained the minimum per capita income threshold. South Africa is the dominant economy in the first category which also includes

Botswana, Cape Verde, Lesotho, Mauritius, Namibia, Seychelles and Swaziland.

The second category currently includes Ghana, Senegal and Zambia.

- Fragile countries are countries with low ratings on the World Bank's IDA Resource Allocation Index of institutional quality. Countries in this sub-group are referred to as such because their economic developments to a larger extent can be influenced by non-economic events such as civil conflicts and other political upheavals. Countries in this group currently are Burundi, Central African Republic, Comoros, Democratic Republic of Congo, Cote d'Ivoire, and Eritrea. The rest are Guinea, Guinea-Bissau, Liberia, Sao Tome and Principe, Togo and Zimbabwe.
- Non-fragile low-income countries are those economies whose economic developments can be attributed to more conventional economic factors. Countries in this group are Benin, Burkina Faso, Ethiopia, the Gambia, Kenya and Madagascar. Others are Malawi, Mali, Mozambique, Niger, Rwanda, Sierra Leone, Tanzania and Uganda.

Gross National Income (GNI) per capita varies significantly across the four groups in the region with that of the middle-income group averaging about US\$ 4,000 per capita in 2010 and that of the oil exporters stood at about US\$ 1,500 per capita (IMF, 2012). However, the GNI per capita levels in low-income countries and the fragile countries are quite similar, at about US\$ 400 and US\$ 500, respectively.

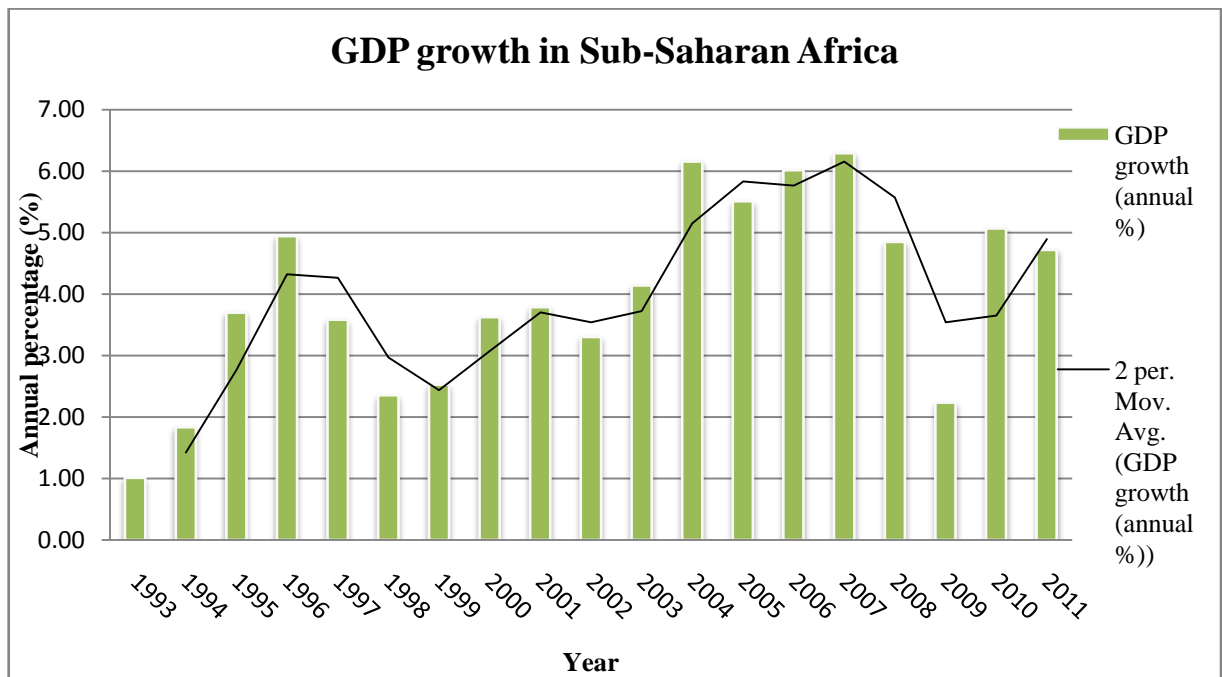
Frey and Volz (2011) observe that the Sub-Saharan African region can also be grouped into 14 Regional Economic Communities (RECs) on the basis of countries which coordinate their economic activities as part of the African Economic Community (AEC) as promulgated by the Abuja Treaty in 1991 and subsequently in 1994. Virtually all the RECs put strong emphasis on trade integration and in some cases monetary unions.

In recent times, the SSA region has shown a sustained strong growth, particularly among low-income economies, which is an indication of its sharp break with the past when it dawdled far behind other parts of the developing world.

In the rest of this chapter, the study discusses other relevant economic developments that have taken place in the Sub-Saharan African region over the period of the study.

3.3 Trends in Gross Domestic Product (GDP) Growth Rate

The growth in Gross Domestic Product (GDP) over the period 1993-2011 has been generally fair in spite of the global financial crisis which began in late 2007. Since the mid-1990s, output growth in the region's frontier markets has consistently averaged above 4 percent (IMF, 2011). GDP growth at the beginning of the period was 1.01 percent in 1993. It then experienced some slight declines beginning 1997 through 1998 where it grew by 3.58 percent and 2.35 percent respectively before it soared to reach its peak for the period at 6.29 percent in 2007. The region grew impressively during the pre-crisis period (2004-08) with GDP growth averaging 6 ½ percent, well above the average world economic growth of 4.6 percent (IMF, 2012). The impact of the financial crisis on the region led to a significant drop in the growth, reaching a decade low of 2.23 percent in 2009. However, there has been a recovery in the GDP growth rate since it recovered in 2010, recording a level of 4.72 percent in 2011. In sum, during the period under review, gross domestic product grew by 3.71 percentage points depicting a modest growth over the period (World Development Indicators (WDI), 2012).

Figure 3.1: Sub-Saharan Africa: Trends in GDP growth

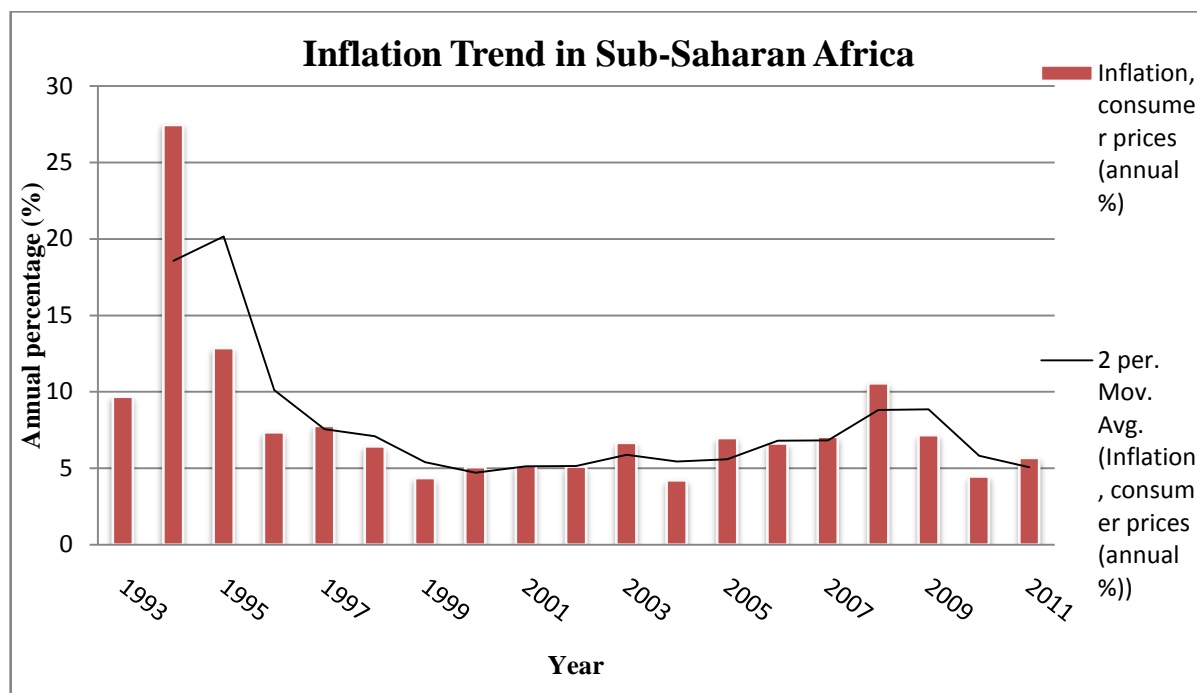
Source: World Development Indicators Database, World Bank.

3.4 Inflation trend in Sub-Saharan Africa

The period (1993-2011) under review generally depicts a downward trend in inflation. The sub-region began the period with an average inflation of 9.67 percent. Inflation subsequently peaked to 27.44 percent in 1994. Since then, average inflation has remained relatively low, hitting a decade low of 4.21 percent in 2004. It however increased slightly to 10.55 percent per annum in 2008. This slight increase in inflation across the region was as a result of various factors. For instance, domestic food prices increased sharply in countries such as Guinea, Kenya, Madagascar and Sierra Leone. Poor harvests due to unfavourable weather conditions were paramount in Benin (Floods) and Kenya (drought). Net staple importers such as Guinea, Sierra Leone and Madagascar also felt the impact of higher international prices. Other factors such as political crisis and foreign exchange shortages fueled inflation in Cote d'Ivoire and Guinea respectively (IMF, 2011). Average inflation in the region has since declined significantly to close the period

at 5.67 percent per annum. On the average inflation in Sub-Saharan Africa over the period declined by 4.0 percentage points (WDI, 2012).

Figure 3.2: Sub-Saharan Africa: Trends in Inflation



Source: World Development Indicators Database, World Bank.

3.5 Financial Development in Sub-Saharan Africa

According to literature, the level of financial development in an economy is very crucial for reaping the potential benefits of financial integration. This brings to mind the level of financial development in Sub-Saharan Africa if financial integration is anything to encourage in the region. There are vast disparities in the level of financial development among the countries in SSA. At one extreme, some countries are in the process of setting up fundamental payments systems and other support infrastructure after a period of political and economic instability (Wakeman-Linn and Wagh, 2008). Others at the other extreme are struggling with policies aimed at fostering offshore banking and effective integration into the global financial markets. Generally, the region is characterized by

shallow and underdeveloped financial markets (Wakeman-Linn and Wagh, 2008). This can be attributed to factors such as poverty, political and economic uncertainties, government fiscal dominance, collateral problems, and property right issues. Others are technological constraints, shortage of skilled personnel with expertise in banking and finance, limited investment opportunities and exposure to external shocks.

Domestic credit to the private sector as a percentage of GDP for instance, has not improved much over the period under review. It inched up marginally from 56.55 percent in 1993 to 58.31 percent in 2011, representing a 1.76 percentage points increase. It however, reached a peak of 65.60 percent in 2007 after it dropped slightly in 2002. The total number of listed domestic companies in the region has reduced from 1039 in 1994 to 932 at the end of 2011. However, the regional market capitalization of listed companies as a percentage of GDP increased from 119.28 percent in 1994 to 149.14 percent as at the end of 2006 (WDI, 2012).

Most of the banking systems in Sub-Saharan Africa proved resilient to the 2008-2009 financial crises although there were pressures on loan quality, profitability and bank liquidity. This was due to the fact that most of the banking systems in the region rely on stable domestic retail funding which is relatively stable and also the banking sector had small cross-border liabilities. South Africa was the most affected by the financial crisis because its equity market and deep liquid bond market attracts substantial amounts of foreign portfolio investment, which saw sharp reversals during the crisis (IMF, 2012).

3.6 Trends in Portfolio Equity flows to Sub-Saharan Africa

Portfolio equity, net inflows is defined by the World Bank as a composition of net inflows of equity securities other than those recorded as direct investment. It includes shares, stocks, depository receipts and direct purchases of shares in local stock markets

by foreign investors. From a general perspective, Sub-Saharan African region has seen a tremendous improvement in the net inflows of portfolio equity over the period 1993-2011. It increased from about 0.303 percent of GDP in 1993 to about 2.766 percent of GDP in 1999 to register the highest inflow for the period under study (WDI, 2011). It dropped sharply in the year 2000 through 2002 due to the terrorist attack on the World Trade Centre (WTO) in the U.S.A. It regained momentum in the last quarter of 2002 and climbed up to a peak of about 2.21 percent of GDP in 2006. Following the 2007 financial turmoil in the U.S.A., the region experienced a sharp reversal of the inflows of portfolio equity, resulting in a record loss of about US\$ 5.69 billion (representing -0.569 percent of GDP) in 2008. However, it saw a significant recovery during the latter part of 2008 through mid-2010, although it is currently showing a downward trend due to the effects of the sovereign debts crises in the Euro zone (IMF, 2012).

Amongst the countries in Sub-Saharan Africa, South Africa is the single largest recipient of portfolio equity followed by Cape Verde and Zimbabwe (IMF, 2012). According to the coordinated portfolio and direct investment surveys, equity investments constitute a significant portion of South Africa's GDP. It is therefore no surprise that it was the most affected economy in the region during the global financial turmoil after the Lehman collapse. In addition to South Africa, 10 other advanced financial markets in Sub-Saharan Africa experienced significant capital outflows in late 2008 and these eventually reverted to inflows in the later part of 2009 (IMF, 2012).

The main drivers of portfolio equity flows to SSA can be categorized into two main factors, pull and push factors. The pull factors are the conditions pertaining in the SSA region that have attracted portfolio equity flows to the region.

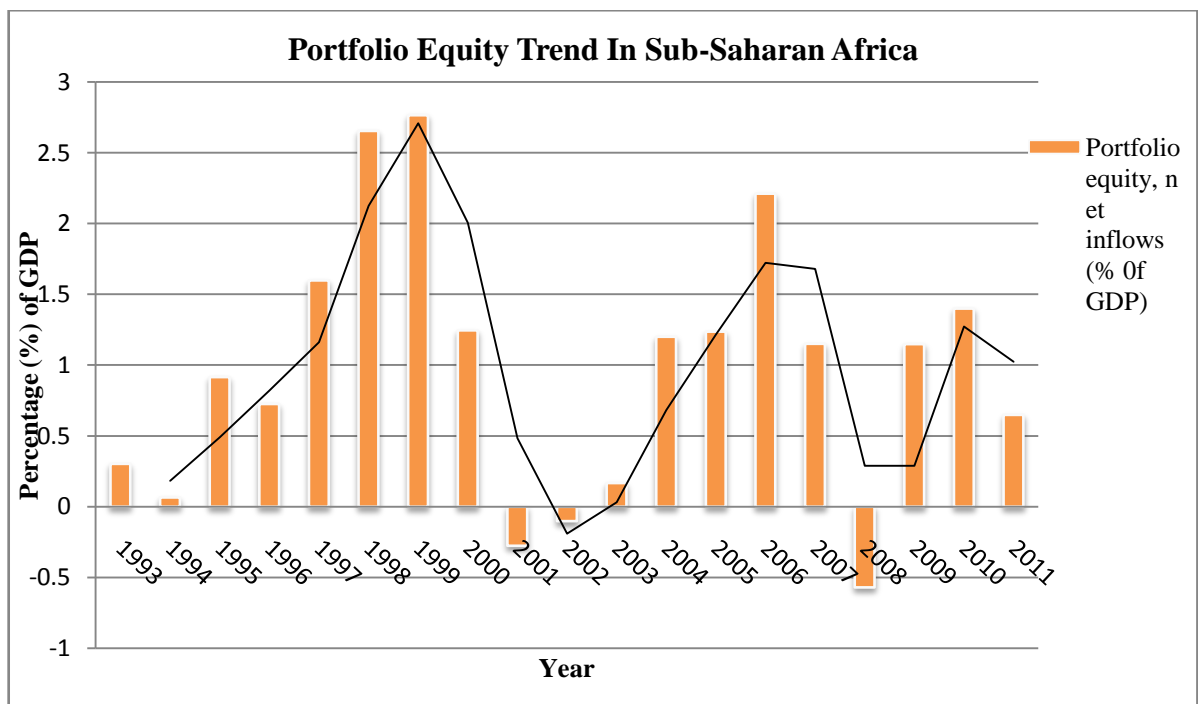
The pull factors factor include;

- i) The relatively stable political environment in the SSA region despite a few civil strives in recent times. Most of the countries in the region are practicing democratic rule which is based on the principle of rule of law. It therefore reposes some confidence in the investment community since they will be able to exercise their property rights.
- ii) The economic conditions in the SSA region have remained robust and the countries, except South Africa, show solid growth prospects despite the recent sluggish global economy (IMF, 2012). The good growth outlook places the region above other emerging market destinations.
- iii) The resilient nature of the SSA economies against the shocks from the global economy makes is the preferred investment destination given the current uncertain global economic developments. Except for Mauritius and Nigeria, and South Africa which were badly affected by the 2007 financial turmoil and the recent Euro debt crisis respectively, most of the region has remained resilient and unshaken by events on the global economy. Investors who prefer to insulate their investments therefore head for SSA.
- iv) Returns on investment in the region are still high due to the limited competition and the untapped resource potential in the SSA region. The untapped potentials in the region attract foreign investors who want to venture into new areas and make more returns on their investment.

The push factors on the other hand, are situations pertaining in the originating economies that cause portfolio equity to flow from such economies. Such factors include the need to diversify investment risk internationally; and the need to avoid unfavourable tax regimes in the advanced economies which could reduce returns on investment.

On the whole, portfolio equity net inflows in the SSA region have improved significantly by about 0.346 percentage points over the period from about 0.303 percent of GDP in 1993 to about 0.649 percent of GDP in 2011, despite the slight volatilities that were recorded.

Figure 3.3: Sub-Saharan Africa: Trends in Portfolio Equity Flows



Source: World Development Indicators Database, World Bank.

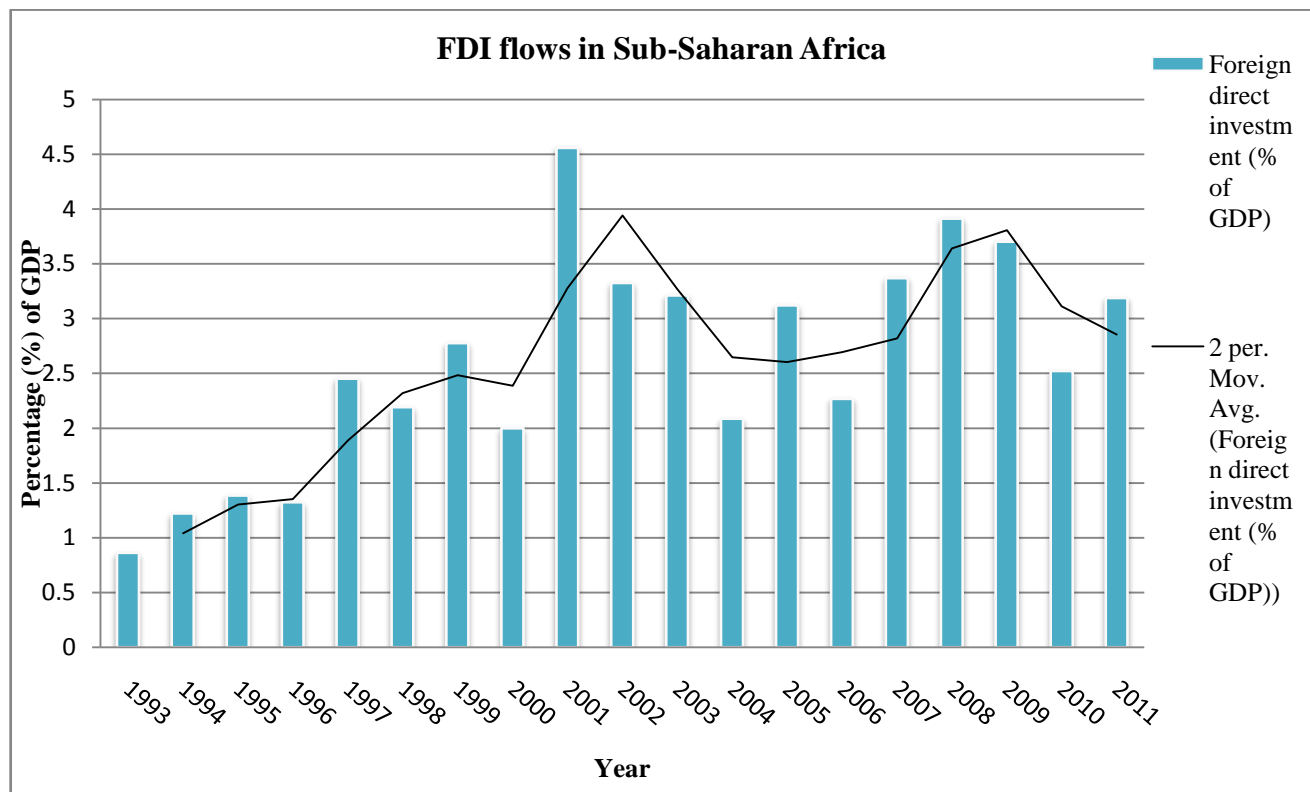
3.7 Foreign Direct Investment in Sub-Saharan Africa

According to the World Bank, Foreign Direct Investment (FDI) is the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment or earnings, other long-term capital and short-term capital. FDI inflows to Sub-Saharan Africa partially reflects foreigners interest in resource extraction activities, nonetheless, a diversification of the exports commodities is in

progress (IMF, 2011). Also, FDI inflows to the sub-region are often attracted by tax concessions and favourable contract arrangements with the government.

FDI net inflows in SSA over the period 1993-2011 has generally improved significantly from about 0.861 percent of GDP in 1993 to about 3.187 percent of GDP in 2011, representing an increase by 2.325 percentage points (WDI, 2011). However, it was relatively less volatile compared to portfolio equity net inflows over the same period. This can be attributed to the relatively long-term nature of FDI in the SSA. Since 1997, FDI inflows to Sub-Saharan Africa have generally showed an upward trend with slight declines in 2000, 2004 and 2006. It however attained a peak of about 4.559 percent of GDP in 2001. This significant increase in FDI inflows can be attributed to the resource boom over the last decade. For instance, the discovery of oil in commercial quantities in Ghana in 2007 had led to a substantial investment in the oil sector of the Ghanaian economy. Angola being one of largest producers and exporter of oil in Sub-Saharan Africa has received unusually large FDI over the period. In 2000 FDI inflows to Angola accounted for about 40 percent of its GDP.

Also, Angola's membership to the Organization of Petroleum Exporting Countries in 2007 is expected to boost further investments in the oil sector. The region, however, experienced a decline in FDI inflows beginning 2009 due to the crisis that afflicted advanced country financial markets between 2008 and 2009 (IMF, 2012). Angola not included, FDI in SSA frontier markets has averaged only 2.6 percent of the regions GDP during 1991-2009 (IMF, 2011). FDI inflows have since recovered and are expected to improve in the near future. South Africa is an important recipient of FDI in sub-Saharan Africa, having increased sharply over the past decade. This notwithstanding, inflows to South Africa declined marginally to a little less than a quarter of its receipts for 2009 (UNCTAD, 2011).

Figure 3.4: Sub-Saharan Africa: Trends in Foreign Direct Investment

Source: World Development Indicators Database, World Bank.

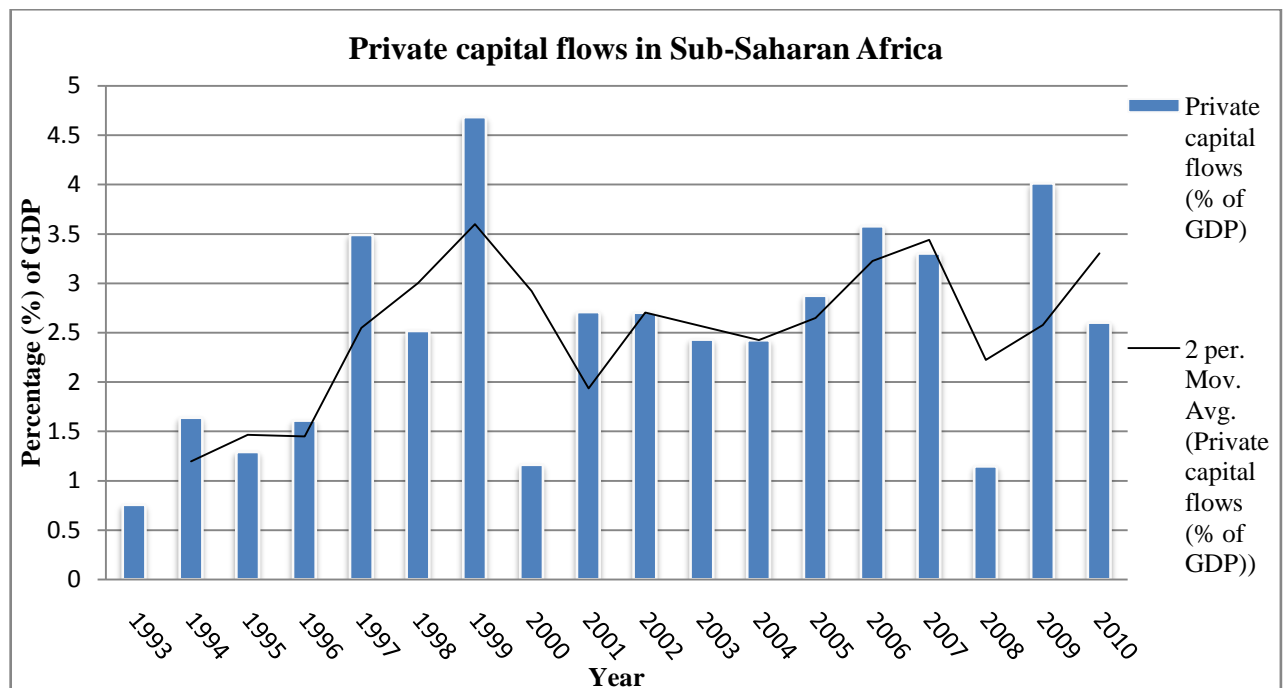
3.8 Private Capital Flows to Sub-Saharan Africa

The World Bank refers to private capital flows as consisting of net foreign direct investment and portfolio investment. That is, the sum of portfolio equity net inflows and FDI net inflows. Private capital flows (PCF) over the period 1993-2010 have generally shown an upward trend mirroring the steep rise in private capital flows to emerging and developing countries. During the period under review, PCF increased from about 0.753 percent of GDP in 1993 to about 2.6 percent of GDP in 2010.

Although there was a brief reversal during the apex of the financial crisis between 2008 and 2009, there has been a recovery due to the very low interest rates in the advanced countries, the increasing need to diversify risk globally and the scout for attractive investment opportunities (IMF, 2011). Understanding the determinants of and the scope

of private capital inflows is important for sub-Saharan African countries for various reasons. First, such flows are progressively the main source of external financing for many countries in the region. Also the deterioration of the fiscal accounts of most advanced countries due to the financial turmoil creates some doubt about their ability to sustain even their current levels of official financing (IMF, 2011). Second, private capital flows tend to be more volatile, at times large relative to the size of the recipient economy. These huge inflows can create tortuous problems in macroeconomic management given the limited monetization and shallow financial markets.

Figure 3.5: Sub-Saharan Africa: Trend in Private Capital flows.



Source: World Development Indicators Database, World Bank.

To further describe the nature and trend of private capital flows to Sub-Saharan Africa, the IMF makes use of the term “Frontier Markets” (FMs).

Frontier markets (FMs) describe a subset of emerging markets that have small financial sectors and have low annual turnover and liquidity, but do demonstrate a relative

openness to and accessibility for foreign investors. For sub-Saharan Africa, the criteria used to select countries into this category includes recent growth dynamics, financial market development, general institutional conditions and its evolution, natural resource endowment, and political stability.

To this extent, SSA's frontier markets include countries such as Angola, Ghana, Kenya, Mauritius, Mozambique, Nigeria, Senegal, Tanzania, Uganda, Zambia and Zimbabwe.

3.8.1 The Nature and Volume of Capital Flows to Sub-Saharan African Frontier Markets

Over the last two decades, there has been a tremendous change in the external sources of funding for investment and growth in SSA. Total capital flows have increased by six-fold since 2000 (IMF, 2011). Contrary to the previous decade, most of the inflows have come from the private sector, excluding South Africa and Nigeria. Interestingly, however, not all the countries in SSA have participated equally in attracting private capital inflows especially, portfolio inflows. Total net private inflows amounted to about \$41 billion dollars in 2010, while South Africa accounted for more than 40 percent of the total inflows (IMF, 2011).

Although FDI flows has been a relatively stable component of private capital inflows to the region, net portfolio inflows have been volatile, with significant net outflows occurring during 2008. The last two years has seen a rise in net portfolio inflows to the region, totaling about half of net private inflows in 2010. More specifically, net portfolio investment flows to FM countries in SSA amounted to about ½ a billion U.S. dollars in 2010. The main constituents of portfolio flows are holdings of government (treasury) securities and private equity, with private equity dominating. Portfolio holdings by

foreigners declined sharply in 2008 and rebounded by the same amount in 2010 in most FMs in SSA (IMF, 2011). According to the IMF's Coordinated Portfolio Investment Survey, average foreign holdings (excluding Mauritius and Nigeria) were about US\$ 450 million in 2010, higher than the previous peak in 2007. Private capital flows into government coffers through two main channels, treasury bills (T-bills) and government (sovereign) bonds; of which T-bills plays a dominant role. Most of the inflows in government coffers have taken the form of T-bills, 91-day to be precise, although long-dated government bonds denominated in domestic currencies are gaining prominence in Kenya and Mauritius.

The past decade has witnessed relatively few international sovereign bond issuances by frontier markets in SSA compared to other emerging market FMs. Most of the SSA bond issuances took place in 2007. Among the FMs in the region, only Ghana, Nigeria and Senegal have ever issued sovereign bonds (IMF, 2011). In 2007, Ghana issued two bonds valued at US\$950 million and Nigeria issued one for US\$525 million. In 2009, Senegal had its maiden issuance of US\$200 million. Nigeria recently issued another bond for US\$500 million during the first quarter of 2011. Aside the FMs in SSA other countries that have also issued sovereign bonds are South Africa, Gabon and Seychelles.

As noted earlier, equity investments have been the largest component of total portfolio investment in SSA. Equity prices in SSA FMs have recovered slowly, perhaps moving in line with FMs in other emerging market economies. Country-specific factors have held back stock price movements in the region. In Kenya for example, uncertainties about the 2010 constitutional referendum weighed down prices, but then after, foreign investment has increased substantially in excess of the 2009 figure. Elsewhere in the region, a combination of looming election, governance issues at the stock exchange and domestic banking crisis have reduced investor appetite for the Nigerian economy. This

notwithstanding, Nigeria is beginning to show some promise following a recovery in almost all sub-Saharan Africa FMs.

The resurgence of private capital flows in sub-Saharan Africa after the 2007 financial crisis has assumed a different dimension. While a few FMs have recaptured investor interest fostering renewed surge in inflows, others have been sidelined. For instance, Ghana, Mauritius and Zimbabwe, owing to different reasons, have all registered significant new inflows in recent times. Ghana's response to its macroeconomic imbalances resulted in the tightening of its fiscal and monetary policies in 2009 and subsequently, in 2010. Other factors such as robust growth prospects brought in by the strong performance in the gold and cocoa sectors and the commencement of oil production, all boosted investor interest in Ghana (IMF, 2011).

According to the IMF (2011) the resurgence of capital inflows to Mauritius mostly reflects developments in emerging markets. Mauritius acts as a platform for investors bound for Asia and sub-Saharan Africa. Although domestic interest rates are low, the country has benefited from favourable investor sentiment and has attracted all categories of capital inflows in excess of the pre-crisis levels. In the case of Zimbabwe, the aftermath of the implementation of an economic stabilization in 2009 has been a surge in portfolio equity investment and foreign currency deposit inflows.

Zambia has made modest recovery after the crisis and net capital inflows have mainly taken the form of FDI (IMF, 2011). Economic growth has been strong and copper prices have increased as well. However, the economy recorded negative net portfolio flows during 2009-2010 indicating the disinvestment in government securities by foreign investors, decreasing their share from 11 percent (US\$ 250 million in early 2009 to 1 ½

percent (US\$ 30 million) at the end of September, 2010. Kenya also saw a surge in private capital flows in 2009, but declined again in 2010.

3.8.2 Local Factors Determining the Supply of Funds in Sub-Saharan Africa

Generally, the relative size and composition of capital inflows to Sub-Saharan Africa to a greater extent can be attributed to a number of country-specific pull factors. For all investment grades, the expected rate of return and its associated risk determine the prospects of the investment. The rate of return on debt securities and loans are determined by interest rate, exchange rate and their associated volatilities. This section of the chapter explains some of the local factors that have influenced capital inflows in Sub-Saharan Africa.

Policy rate

According to the IMF (2011), survey report indicates that lower domestic interest rates relative to the pre-crisis period have been a very significant factor in the relatively sluggish resurgence of debt portfolio inflows to SSA. To curtail the effects of the global economic downturn, most SSA countries resorted to expansionary fiscal and monetary policies. In fact, policy rates were reduced by nearly 4 percentage points on average between 2008 and 2010 (IMF, 2011). Average policy rates in SSA FMs also declined more than that of any other frontier in the emerging markets.

Yields on government securities

Yields on government securities often reflect the evolution of policy rates. They are very instrumental in the distribution of debt portfolio inflows. Prior to the crisis, Ghana, Tanzania, Uganda and Zambia received substantial carry trade operations owing to high

yields, this however declined after the monetary easing. For instance, yields on 91-day T-bills rose by 2 ½ percent on the average at the onset of the crisis in 2008, it subsequently lost 4 ½ percentage points to close the year 2010 at an average of 7 ¾ percent (IMF, 2011).

Exchange rate Depreciation

Frontier markets in SSA have experienced an acute depreciation in exchange rate since the global crisis. While there seems to be resurgence in exchange rates in most emerging market economies the same cannot be said for FMs in SSA. On the contrary, FMs in SSA are experiencing a downward trend which is believed to have affected investor perceptions of the risk of further depreciation.

Macroeconomic Policies

There has been a tremendous improvement in macroeconomic policies in most sub-Saharan African countries, prominent amongst them is Zimbabwe. In some countries struggling with excessive public debt, as is the case in Ghana, a combination of fiscal and monetary policies have generated high yield, as its credit worthiness is underpinned by other favourable conditions, such as in the oil sector (IMF,2011).

Political Uncertainty

Civil strife and other political upheavals in some Sub-Saharan African countries have contributed significantly to the sluggishness of inflows into the region due to uncertainties created in the minds of investors. For instance, prospective elections in Uganda (February 2011) and Nigeria (April 2011) may have contributed to the apathetic flow of private capital into these countries. Similarly, uncertainties about Kenya's 2010

constitutional referendum weighed down prices and caused a slight reduction in foreign capital inflows.

3.9 Trends in Portfolio equity flows in Emerging Market Economies (EMEs)

Portfolio equity net inflows as a percentage of GDP to emerging market economies (EMEs) have remained relatively volatile as shown in Figure 3.6. However, Sub-Saharan Africa seems to have attracted a relatively greater percentage over the period 1993-2011. At the beginning of the period, SSA's portfolio equity net inflows to GDP was relatively low compared to that of the Latin America and Caribbean, and East Asia and Pacific. Portfolio equity inflows to SSA gained momentum in 1994 when inflows to other emerging markets were declining. In fact, between in 1994 and 1999 SSA received the highest percentage of inflows to reach a record high of 2.76 percent of GDP in 1999. The terrorist attacks on the World Trade Centre (WTO) in 2001 caused a general decline in portfolio equity flows amongst the EMEs, of which SSA was the worst affected followed by Middle East and North Africa. Following the attacks, portfolio equity net inflows to SSA slumped from about 1.245percent of GDP in the year 2000 to about -0.276 percent of GDP in 2001, although none of the other EMEs barely recorded a negative percentage.

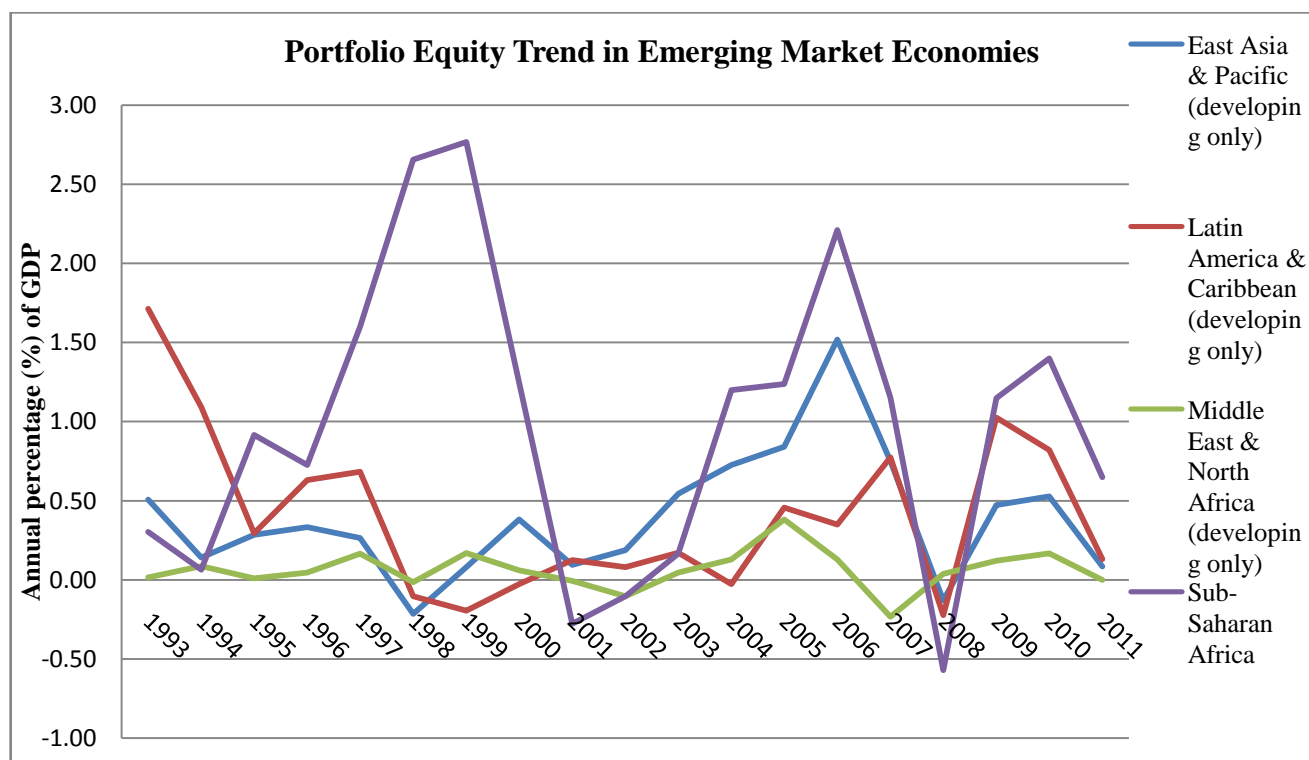
Between the years 2002 and 2006 when there was a general recovery in portfolio equity flows among the EMEs, led by SSA and followed by East Asia and Pacific, and Latin America and Caribbean in that order. Again, portfolio equity net inflows to SSA reached a peak of about 2.211 percent of GDP in 2006 before it declined heavily in response to the 2007 financial turmoil in the U.S.A. SSA registered the deepest fall off of about -0.57 percent of GDP followed by Latin America and Caribbean, and then East Asia and Pacific. The story was slightly different for Middle East and North Africa as they

experienced the shock earlier in 2007 and were recovering in 2008 as the other EMEs slumped. There has since been a recovery in all the EMEs with SSA in the lead once again. However, the looming Euro debt crisis is expected to have some impact on portfolio equity flows to EMEs.

Although portfolio equity flows to emerging market economies have assumed a downward in recent times, inflows to the SSA region still remains higher or the largest among all the emerging market regions.

In sum, portfolio equity net inflows as a percentage of GDP in emerging market economies has been volatile, responding to almost all significant developments in the global economy.

Figure 3.6: Trends in Portfolio equity flows in emerging market economies.



Source: World Development Indicators (World Bank)

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

A review of literature reveals that various estimation methods have been employed in analyzing the impact of financial integration on economic growth. Some authors have applied estimation techniques such as a combination of ordinary least squares (OLS) method and weighted least squares (WLS) method (Grilli and Milesi-Ferretti, 1995; Frey and Volz, 2011), beta-convergence and sigma-convergence (Sy, 2006; and Yabara, 2012), Johansen approach to cointegration (Afzal, 2007) and the generalized methods of moment (GMM) (Edison et al, 2002; Kose et al., 2009; Ahmed, 2011; and Sedik and Sun, 2012). However, literature suggests that the choice of estimation technique employed in a study depends on the variables and the objective of the study.

This chapter of the study describes the estimation method, the statistical programme and data used to analyze the impact of financial integration on economic growth in the Sub-Saharan African region. First and foremost, we look at the theoretical framework of the model employed in the analysis. The justification is to place the study in its right methodological perspective, with regards to the necessary tools for estimation and analysis. The study proceeds to look at how the estimation technique has been applied in empirical studies in this area of study. This chapter also describes the variables used in the analysis and sources from which they are drawn.

4.2 The Econometric Model

In looking at the econometric model employed in data analysis of the relationship between international financial integration and economic growth in SSA, the study considers both the theoretical foundations and the empirical models that have been employed in literature.

4.2.1 The Theoretical Framework

The study explains economic growth from the perspective of the Solow growth model which assumes that the rate of savings, population growth and technological progress are exogenous. The Solow growth model also posits that there are two inputs, labour and capital, which are paid their marginal products.

The Solow growth model assumes a Cobb-Douglas production function such that production at time t is given by

$$Y(t) = K(t)^\alpha (A(t)L(t))^{1-\alpha} \dots\dots\dots (1) \quad 0 < \alpha < 1.$$

Where Y is output, K is capital, L is labour and A is the level of technology. L and A are assumed to grow exogenously at rates n and g :

$$L(t) = L(0) e^{nt} \dots\dots\dots (2)$$

$$A(t) = A(0) e^{gt} \dots\dots\dots (3)$$

Thus, the number of effective units of labour, $A(t)L(t)$, grows at rate $(n + g)$.

The Solow model also assumes that growth in output per worker, $y(t)$ is explained by initial output per worker, $y(0)$, the initial level of technology, $A(0)$, the rate of technological progress, g , the savings rate, s , the growth rate of the labour force, n , the depreciation rate, δ , the share of capital in output, α , and the rate of convergence to the

steady state, λ . The model suggests that a high savings rate will affect growth in output per worker positively, whereas high labour force growth will have a negative effect on growth in output per worker. This is presented mathematically as:

$$\ln y(t) - \ln y(0) = -(1-e^{-\lambda t}) \ln y(0) + (1-e^{-\lambda t}) \ln A(0) + gt + (1-e^{-\lambda t}) \frac{\alpha}{1-\alpha} \ln(s) - (1-e^{-\lambda t}) \frac{\alpha}{1-\alpha} \ln(n+g+\delta) \dots \dots \dots (4)$$

where $y(t)$ is the logarithm of output per worker in period t

The current study augments the Solow model by including other relevant variables that determine economic growth in the financial liberalization context.

The econometric estimation technique employed in the current study is based on the Generalized Methods of Moment (GMM) dynamic panel estimation framework introduced by Arellano and Bond (1991) based on the pioneering works of Hausman and Taylor (1981), with major contributions by Bhargava and Sargan (1983). As Arellano and Bond put it “the fundamental identification condition for this model is the strict exogeneity of some of the explanatory variables (or the availability of strictly exogenous instrumental variables) condition on the unobservable individual effects”. A basic assumption of the ordinary least squares (OLS) method suggests that the explanatory variables must be exogenous, $E[\varepsilon_t x] = 0$ (Greene, 2012). Thus, the error terms and the explanatory variables should be contemporaneously uncorrelated. However, for some statistical and economic reasons, this assumption may not always hold. For instance, it would not be prudent to impose this condition in situations such as the presence of a lagged dependent variable and autocorrelation in the error term. Also, measurement errors in the regressors and simultaneity or endogeneity of the explanatory variables may also limit the relevance of this assumption (Verbeek, 2004). At this point, we can hardly

argue that the OLS estimator is unbiased or consistent. The need therefore arise to consider an alternative estimator which is capable of overcoming these problems. The use of the GMM dynamic panel model at this instance is very helpful since it seeks to address some of the problems identified above and more particularly, considering the fact that we are analyzing a panel data set.

As captured by Edison et al. (2002), the motivation for the choice of the GMM dynamic panel estimation model is due to its advantages over other estimation methods: (i) it controls for endogeneity of the weakly exogenous variables that may arise from potential simultaneity or reverse causality in the model; (ii) it also controls for country-fixed effects which is often captured in the error term of some estimation methods; (iii) the GMM dynamic panel model exploits both the cross-sectional and time-series dimension of the data set, thereby increasing the degree of freedom; (iv) the use of panel data increases the sample size thereby reducing estimation biases and enhancing robustness of the model.

The distinguishing feature of the GMM estimators is that, it employs both internal instruments, namely the lags of the endogenous variables and classical instrumental variables.

The application of Hausman and Taylor model has been limited partly due to the difficulty in finding strictly exogenous variables that are convincingly considered a priori as being uncorrelated with the individual effects. Arellano and Bover (1995) sought to further advance the GMM model by specifying valid instruments for the equations in levels, in addition to those available for equations in first differences or deviations from individual means. Subsequently, Blundell and Bond (1998) sought to improve the precision of the standard first-differenced GMM estimator of the model by imposing an

additional restriction on the initial conditions. This they believe will help the linear GMM estimator to utilize all moment conditions available, in a system of first-differenced and levels equations. The model developed by Arellano and Bover (1995) and Blundell and Bond (1998) is known as the “System-GMM”. They assume that the first differences of the instrumental variables are uncorrelated with the fixed effects; therefore, the inclusion of more instruments in the instruments matrix improves efficiency.

The model

The starting point for the panel estimation model is the following growth model characterized by the inclusion of a lagged dependent variable among the explanatory variables:

$$y_{i,t} = \alpha y_{i,t-1} + \beta' X_{it} + \eta_i + v_{it} \dots\dots\dots (5)$$

For $i = 1, \dots, N$ and $t = 2, \dots, T$; where $v_{it} = \eta_i + v_{it}$ is the usual fixed effects decomposition of the error term; η_i is the country-specific fixed effect; N is large, T is fixed and $|\alpha| < 1$.

To eliminate the country specific fixed effects (η_i), we take the first difference of equation (5) to obtain:

$$y_{i,t} - y_{i,t-1} = \alpha(y_{i,t-1} - y_{i,t-2}) + \beta'(X_{i,t} - X_{i,t-1}) + (v_{i,t} - v_{i,t-1}) \dots\dots (6)$$

The model suggests that instrumental variables are required to overcome the issue of endogeneity of the explanatory variables and the problem of correlation between the error term ($v_{i,t} - v_{i,t-1}$) and the lagged dependent variable, ($y_{i,t} - y_{i,t-1}$). On the basis

of the assumption that there is no autocorrelation in the error terms and the explanatory variables being weakly exogenous, the GMM dynamic panel estimator makes use of two moment conditions.

(i) Moment conditions for the differenced equation;

$$E[y_{i,t-s} \cdot (v_{i,t} - v_{i,t-1})] = 0 \text{ for } s \geq 2; t = 3, \dots, T \quad \dots\dots\dots(7)$$

$$E[X_{i,t-s} \cdot (v_{i,t} - v_{i,t-1})] = 0 \text{ for } s \geq 2; t = 3, \dots, T \quad \dots\dots\dots(8)$$

(ii) Moment conditions for the regression in levels;

$$E[(y_{i,t-s} - y_{i,t-s-1}) \cdot (\eta_i + v_{i,t})] = 0 \text{ for } s = 1 \quad \dots\dots\dots (9)$$

$$E[(X_{i,t-s} - X_{i,t-s-1}) \cdot (\eta_i + v_{i,t})] = 0 \text{ for } s = 1 \quad \dots\dots\dots (10)$$

Blundell and Bond (1998) suggest that the moment conditions presented in equations (7), (8), (9) and (10) when employed in the GMM procedure will yield consistent and efficient parameter estimates.

4.2.2 The Empirical Strategy

In carrying out the empirical analysis, we follow literature by adopting the Edison et al., (2002) approach to panel data estimation in assessing the relationship between portfolio equity and economic growth in Sub-Saharan Africa. The empirical model is given as:

$$y_{it} = \gamma y_{it-1} + \alpha IFI_{it} + \beta' X_{it} + \eta_i + \varepsilon_{it} \quad \dots\dots\dots (11)$$

Where y_{it} is the logarithm of real per capita GDP, IFI_{it} is an indicator of financial integration, X_{it} is a vector of control variables, η_i is the unobservable country-specific fixed effects, and ε_{it} is the disturbance term. The subscripts i and t represent country and time period respectively.

As already noted, we use portfolio equity, net inflows to GDP ratio as a measure of financial integration (IFI_{it}). The control variables are the initial level of income measured by the logarithm of initial per capita GDP of the country; initial schooling measured by the logarithm of total public spending on education (% of GDP) as a proxy for human capital; inflation, as a proxy for macroeconomic policy and logarithm of private sector credit to GDP ratio as a proxy for financial development.

To eliminate the country specific effects (η_i), we take the first difference of equation (11) to obtain:

$$y_{i,t} - y_{i,t-1} = \gamma(y_{i,t-1} - y_{i,t-2}) + \alpha(IFI_{i,t} - IFI_{i,t-1}) + \beta'(X_{i,t} - X_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \dots\dots\dots(12)$$

As a common practice in most growth regressions, we average the panel data set over a non-overlapping 3-year period to get rid of business-cycle fluctuations. Averaging the data over 3-year fixed-length intervals, we obtain five observations per country (1996-1998, 1999-2001, 2002-2004, 2005-2007 and 2008-2010).

In order to check for the robustness of the system GMM panel model estimation, we also provide estimates of the Random Effects Generalized Least Squares (GLS) estimator. This estimator is also known as the feasible GLS estimator (EGLS) or the Balestra-Nerlove estimator (Verbeek, 2004). The EGLS estimator is a weighted average of the between and the within estimators where the weight depends upon the relative variances of the two estimators (Verbeek, 2004). Although the OLS estimator is also a linear combination of the between and the within estimators, the EGLS estimator is considered to be a more efficient than the OLS. The fact is that, that the EGLS estimator transforms the OLS estimator to yield an error term which is independent and identically distributed (i.i.d.) over individual observations and time.

The starting point for deriving the EGLS estimator is specified as:

$$y_{it} = \mu + X'_{it}\beta + \eta_i + \varepsilon_{it} \dots\dots\dots (13)$$

and $\bar{y}_i = \mu + \bar{X}'_i\beta + \eta_i + \bar{\varepsilon}_i.$

Where $(\eta_i + \varepsilon_{it})$ is considered as an error term consisting of two components; an individual specific time-invariant factor and a remainder component which is assumed to be uncorrelated over time.

To remove the heterogeneity, we take deviations from the group means to obtain:

$$y_{it} - \bar{y}_i = [X_{it} - \bar{X}_i]' \beta + [\varepsilon_{it} - \bar{\varepsilon}_i]. \dots\dots\dots (14)$$

Where,

y_{it} is the dependent variable, \bar{y}_i is the group mean of the dependent variable, X_{it} is a vector of explanatory variables including the financial openness indicator (IFI), \bar{X}_i is the group mean of the explanatory variables, ε_{it} is the disturbance term and $\bar{\varepsilon}_i$ is the group mean of the disturbance term. The subscripts i and t represent country and time period respectively.

As noted by Verbeek (2004) and Green (2012), the EGLS estimator is unbiased if the explanatory variables are uncorrelated with the disturbance term (ε_{it}) and the country specific time-invariable (η_i). Thus, $E[X_{it}\varepsilon_{it}] = 0$ for all t , and $E[X_{it}\eta_i] = 0$.

The implication is that the explanatory variables have to be exogenous.

The justification for employing the EGLS estimator is due to the fact that, most of the SSA countries have some peculiar qualities which directly or indirectly influence their economic growth but are not captured in the control variables.

For instance, SSA countries have various natural resource endowments such as oil, gold, diamond, copper, etc, which tend to attract foreign investment. Similarly, SSA countries have different political landscape which also influences the degree to which foreign capital flows into each country. For instance, countries such as South Africa, Botswana and Mauritius are considered relatively stable democracies compared to Mali, Cote d'Ivoire and Kenya, which have in recent times experienced some upheavals, and therefore attract more foreign capital flows. Swaziland on the other extreme is a practicing a monarchy style of government. On the basis of the natural resource endowment and the political landscape, one can infer that although the countries belong to one region, each country has unique characteristics.

In this model (EGLS), we use an annual data of 14 Sub-Saharan African countries over the period 1996- 2010. The study regresses per capita GDP growth on financial openness while controlling for initial schooling, inflation, financial development and trade openness. We drop initial income and include trade openness in the control variables in order to avoid the issue of serial correlation.

With regards to the second objective of investigating the determinants of portfolio equity flows in Sub-Saharan Africa, we follow the Vo (2005) approach. This second objective in other words, examines the reverse effect of economic growth on international financial integration. More specifically, portfolio equity is the dependent variable and economic growth is an explanatory variable.

Following the Vo (2005) approach, we employ the system GMM dynamic panel model to investigate the determinant of portfolio equity flows. As identified above, the system GMM model makes use of both the cross-sectional and time dimensions of the panel data.

The system GMM estimation model is specified as;

$$IFI_{it} = \alpha IFI_{it-1} + \beta' X_{it} + \eta_i + \varepsilon_{it} \dots (15)$$

where IFI_{it} is the dependent variable and a measure of portfolio equity flows, X_{it} is a vector of control variables, η_i is the unobservable country-specific fixed effects, and ε_{it} is the disturbance term. The subscripts i and t represent country and time period respectively.

The control variables are economic growth measured by real per capita GDP growth; human capital measured by the logarithm of total public spending on education (% of GDP); inflation, as a proxy for macroeconomic policy; logarithm of private sector credit to GDP ratio as a proxy for financial development; political stability and absence of violence as a proxy for political and country risk; and capital account openness (Kaopen) as a proxy for capital control.

At this instance the study makes use of annual data of 14 Sub-Saharan African countries over the period 1996-2010.

Furthermore, we check for the robustness of the result by replicating the analysis by employing the Random Effect-GLS methodology. The justification for adopting the random effect-GLS method is due to the fact that Sub-Saharan African countries have country-specific factors such as distance or proximity to an international financial centre and natural resource endowments that may be relevant to portfolio equity flows into the region.

4.3 Definition and Measurement of Control Variables

The control variables are other weakly exogenous variables that are believed to have an influence on the level of economic growth aside the main causative variable of interest

(portfolio equity flows) in the estimation model. The control variables included in the model are as follows:

Initial Income equals the logarithm of real per capita GDP (constant, 2000 US\$) in the initial year of the period under consideration. The initial income is included to capture the convergence criterion in the standard neoclassical growth model. Thus, countries with low initial income tend to grow faster on per capita basis than countries with high initial income. Theoretically, we expect countries with lower initial income to experience higher growth than their counterparts with relatively higher initial income. Therefore we expect to find a negative coefficient for this variable as suggested by Barro (1996).

Initial Schooling (EDU) equals the logarithm of the total public spending on education (% of GDP) in the initial year of the period under consideration. Initial schooling is included in the model as a proxy for human capital in the classical growth model. Theoretically, the level of human capital in an economy is an indication of the stock of competencies, knowledge, social and personality attributes, including creativity embodied in the ability to perform labour so as to produce economic value. Therefore, high public spending on education is expected to provide adequate infrastructure, study aids and all other requirements to facilitate education. Governments usually incur expenses on education in order to develop, build and improve the productive capacity of its human capital (labour force) to foster economic growth. We anticipate a positive coefficient for this variable (human capital) as was identified by Barro (1996).

Financial Development (FD) equals the logarithm of domestic credit to private sector as a share of GDP. The level of financial development in an economy is very crucial to growth since it dictates the ease with which entrepreneurs' can access credit for productive activities. Similarly, financial development in the context of financial

openness informs investors on the extent to which they can diversify their investment and easily repatriate it if the need arises. Although there are various measures of financial sector development in the category of credit intermediation, depth or liquidity management, and risk management characteristics, we choose domestic credit to the private sector in order to measure the efficiency of the financial intermediaries in the intermediation process. It is also a very common indicator of the size of the financial sector (Frey and Volz, 2011). Our expectation is a positive coefficient for this variable as observed in other studies such as King and Levine (1993) and Levine and Zervos (1998).

Inflation (INF) equals the growth rate of the consumer price index (CPI) in an economy and is used as a measure of macroeconomic stability and prudent economic management. Theoretically, inflation increases the cost of borrowing for investment activities, leading to a reduction in productivity and staggered growth. Furthermore, inflation in the context of financial globalization will limit capital inflows and rather encourage capital flight since inflation will erode the gains realized from investment activities. Investors will then look for better opportunities in other countries where inflation is relatively lower. We therefore expect a negative coefficient for this variable as was identified by Barro (1996).

Trade Openness

The Organization for Economic Cooperation and Development (OECD) define Trade openness as the sum of a country's total exports and total imports as a ratio of its gross domestic product (GDP). The positive impact of trade openness on economic growth is in two folds. First, the export of goods and services abroad earns the country more foreign exchange. As the foreign exchange increases, it improves the country's current account surplus thereby putting it in a better position to meet its international obligations and even lend to other countries. On the other hand, a decline in the export of goods and services relative to imports reduces a country's net foreign assets, thereby worsening its current account balance.

Second, the importation of essential goods and services to facilitate production can also promote economic growth. For instance, the import of medical supplies, capital equipment and expertise can help a nation to efficiently produce goods and services which ultimately enhances the welfare of its citizens. However, excessive importation without a corresponding increase in exports will lead to a reduction of its net foreign assets and ultimately worsen the country's current account balance. Since a current account surplus is an indication of an increase in net foreign assets, we expect a positive sign for the trade openness coefficient as was identified by Barro (1996)

Economic Growth

Economic growth refers to the rate at which the per capita income of an economy changes over time. It is usually used as a measure of the level of development of a country. Economic growth in the study is measured by the growth in real per capita income. This measure of economic growth is one of the commonest and widely used measures in literature.

In the context of this study the level of economic growth of a country plays a significant role in attracting portfolio equity into that country. Literature suggests that investors are attracted to economies with better growth prospects since such economies are often associated with rates of return on investment. The study expects a positive sign for the economic growth coefficient as suggested by Edison et al. (2002), and Vo and Daly (2004).

Political and Country risk

Political and country risk refers to the extent to which a country is politically stable and free from any form of civil strife or terrorism. This factor is very important for portfolio equity flows since investors will not like to invest in countries where there is a possibility of losing their capital owing to political unrest such as wars and conflict.

Political and country risk in the study is measured by the World Bank's estimate of political stability and absence of violence or terrorism. According to the index, countries with relatively stable political environment have higher indices than fragile countries or those prone to conflict and terrorism. A positive sign is expected for the political and country risk coefficient since a stable country is more likely to attract portfolio equity flows into an economy as observed by Vo (2005) and Von Furstenberg (1998).

Capital Controls

Capital controls refers to the extent to which there is no legal impediments restricting cross-border capital mobility. Countries with less legal restriction on capital movements are believed to be more open and likely to experience more capital mobility than countries with much more legal restrictions on capital mobility.

The most popular *dejure* measure of the presence of capital controls is the IMF's AREAER. However, due to data availability issues the study use of the Chinn-Ito index

(2011) as a proxy for capital controls. The Chinn-Ito index is an index based on the IMF's AREAER but measures both the presence and the extent of openness in capital account transactions. Countries with more open capital accounts and have experienced significant capital flows had higher indices than those with more restrictions and less capital mobility. The study therefore expects a positive sign for the coefficient of the capital control variable as suggested by Bhaskaran et al. (2005).

4.4 Diagnostic Tests

To ensure that the estimation results are reliable, we carry out various tests to ascertain the appropriateness of the variables and models used in the analysis.

4.4.1 Unit-root Test

First and foremost, before carrying out the panel date estimation, a panel unit-root test is undertaken to ascertain the stationarity or otherwise of the panel data-set. The unit-root test is necessary in order to prevent distortions in estimated regression relations and spurious regressions due to time-series process (Greene, 2012).

Specifically, the Augmented Dickey-Fuller (ADF) test for unit-root is conducted on all the variables. The unit-root test is conducted on the null hypothesis that all panels contain unit-roots; thus, all the panels are non-stationary. As a robustness check, we conduct the Im-Pesaran-Shin (IPS) test for unit-root to verify the results of the ADF test.

Post-estimation Tests

To check for the accuracy of the system GMM estimator, we follow literature by conducting two main post-estimation diagnostic tests:

- (i) Sargan test - to examine and report the valid of the internal instruments employed in the system GMM model;
- (ii) Autocorrelation test – to test for serial correlation of the error term.

4.4.2 Sargan Test

The Sargan test is a test used to check for over-identifying restrictions in a statistical model (Verbeek, 2004). It is used to test the null hypothesis that the instrumental variables are uncorrelated with some set of residuals and are therefore acceptable instruments. The Sargan test is also known as the Hansen test or J-Test for Over-identifying restrictions.

In deciding whether or not to accept the null hypothesis, we compare the calculated probability value (p-value) against the conventional significance level of 0.05. If the calculated P-value is greater than 0.05, we fail to reject the null hypothesis. On the other hand, if the calculated p-value is less than 0.05, we reject the null hypothesis and accept the alternative hypothesis. If the null hypothesis is not rejected, the instruments are deemed to have passed the test and are considered to be valid instruments by this criterion. The higher the p-value of the Sargan statistic the better, indicating that the instruments as a group are exogenous.

4.4.3 Autocorrelation Test

We also test for the presence of autocorrelation in the model as the error terms may be correlated. The test has a null hypothesis of no autocorrelation and is done for the differenced residuals. Usually, the autocorrelation test for the first order autoregressive process [AR (1)] rejects the null hypothesis, since by construction;

$$\Delta\varepsilon_{i,t} = \varepsilon_{i,t} - \varepsilon_{i,t-1} \text{ and } \Delta\varepsilon_{i,t-1} = \varepsilon_{i,t-1} - \varepsilon_{i,t-2} . \text{ Thus, both have } \varepsilon_{i,t-1}.$$

However, the autocorrelation test for the second order autoregressive process [AR (2)] in first difference of utmost importance, since it will detect autocorrelation at levels (Edison et al, 2002).

Similarly, in deciding whether or not to accept the null hypothesis, we compare the calculated probability value (P-value) against the conventional significance level of 0.05. If the calculated P-value is greater than 0.05, we fail to reject the null hypothesis. On the other hand, if the calculated P-value is less than 0.05, we reject the null hypothesis and accept the alternative hypothesis. If we fail to reject the null hypothesis, it implies no autocorrelation in the model. However, if we reject the null hypothesis, it implies the presence of autocorrelation.

4.4.4 Hausman Specification Test

The specification test developed by Hausman (1978) is used to test whether or not the explanatory variables are correlated with the disturbance term. Thus, this test examines the endogeneity of the explanatory variables. The issue of endogeneity is very important for the EGLS estimation model since the estimator becomes inefficient when the regressors are endogenous (Verbeek, 2004). When the regressors are found to be exogenous, the EGLS estimator becomes a consistent and efficient estimator relative to the within estimator (Fixed effects).

The Hausman specification test is conducted on the null hypothesis that, the EGLS and the fixed effects estimators are not significantly different. Thus, $\text{plim}(\beta_{FE} - \beta_{RE}) = 0$.

The test follows a Chi-squared distribution with K degrees of freedom, where K is the number of elements in the estimator. In deciding whether or not to fail to reject the null hypothesis, we compare the estimated probability value (p-value) with the conventional significance level of 0.05. If the estimated p-value is greater than 0.05, we fail to reject the null hypothesis and conclude that, there is no significant difference between the EGLS and the fixed effects estimator. It therefore implies that, the regressors are uncorrelated with the error term so, the EGLS estimator is a consistent and efficient

estimator. In other words, if the null hypothesis is not violated, the fixed effect and the EGLS are consistent but the fixed effect is inefficient.

On the other hand, if the estimated p-value is less than 0.05, we reject the null hypothesis and conclude that the EGLS and the fixed effects estimator are significantly different. It therefore implies that, the regressors are correlated with the error term so, the EGLS is not an efficient estimator so, we resort to the fixed effects estimator. Stated differently, if the null hypothesis is violated, it implies that the fixed effects estimator is consistent but the EGLS is inconsistent and biased.

4.4.5 Breusch and Pagan Lagrange Multiplier Test for Random Effects (LM Test)

The Breusch-Pagan Lagrange multiplier test is a conducted to ascertain whether not there is heteroskedasticity in the EGLS or the Random effects model. Since the property of homoskedasticity is one of the basic assumptions of the OLS estimator, it is necessary to test for homoskedasticity in the EGLS estimator, which happens to be a transformed and more efficient OLS estimator.

The property of homoskedasticity assumes that, variance of the error terms must be constant over the fitted values in the model.

Thus, $\text{Var} [\varepsilon_i | \mathbf{X}] = \sigma^2$, for all $i=1 \dots n$,

and $\text{Cov} [\varepsilon_i \varepsilon_j | \mathbf{X}] = 0$, for all $i \neq j$.

The assumption of homoskedasticity is necessary for the computation of appropriate standards errors and its corresponding t -tests.

The Breusch-Pagan LM test is conducted under the null hypothesis of homoskedasticity (Greene, 2012). The test follows a chi-squared distribution with degrees of freedom equal to the number of explanatory variables. To decide whether or not to fail to reject the null hypothesis, we compare the estimated p-value with the conventional 0.05 significance level. If the estimated p-value is greater than 0.05, we fail to reject the null hypothesis and conclude that, the error terms exhibit the property of homoskedasticity. The implication is that, the estimated standard errors and their associated t-tests are appropriate. On the other hand, if the estimated p-value is less than 0.05, we reject the null hypothesis and conclude that, the error terms are heteroskedastic. This may imply that the model is wrongly specified or there is the presence of outliers in the model.

4.4.6 Wooldridge Test for Autocorrelation

The study also tests for the presence of autocorrelation in the GLS Random-effects (EGLS) model by employing Wooldridge's Test for autocorrelation in panel data. Wooldridge (2002) proposes a test for autocorrelation which uses residuals from a first-differenced regression.

Thus,

$$y_{it} - y_{it-1} = [X_{it} - X_{it-1}]' \beta + [\varepsilon_{it} - \varepsilon_{it-1}] \quad \text{Or} \quad \Delta y_{it} = \Delta X_{it} \beta + \Delta \varepsilon_{it}$$

Where, Δ is the first-difference operator.

The essence of first-differencing the equation is to eliminate country-specific time-invariant variables and the constant term. The test is conducted on the null of no first-order autocorrelation.

Similarly, in deciding whether or not to fail to reject the null hypothesis, we compare the estimated probability value (p-value) with the conventional 0.05 level of significance. If

the estimated p-value is greater than 0.05, we fail to reject the null hypothesis and conclude that, there is no first-order autocorrelation in the model. The implication is that, the error terms are not correlated so, the standard errors are unbiased and the estimates are efficient. However, if the estimated p-value is less than 0.05, we reject the null hypothesis and conclude that, there is first-order autocorrelation in the model. The implication of this outcome is that, the model may be wrongly specified or an important variable has been excluded from the model.

4.5 The Data and sample size

The study uses a sample of 14 Sub-Saharan African countries. The countries are Benin, Botswana, Cote d'Ivoire, Cameroon, Kenya, and Mali. Others are Mauritius, Namibia, Niger, Senegal and South Africa. The rest are Swaziland, Togo and Zambia. The choice of countries included in the study is mainly based on data availability on our variable of financial integration; portfolio equity, net inflows. The panel data covers the period from 1996 to 2010.

Data on Portfolio equity, net inflows (current US\$), GDP per capita growth (annual %), GDP per capita (current US\$), total public spending on education (% of GDP), domestic credit to private sector (% of GDP) and trade openness are obtained from World Development Indicators (WDI) database of the World Bank. Similarly, data on political stability is obtained from the World Governance Indicators (WGI) of the World Bank. Data on capital account openness is obtained from the Chinn-Ito (2011) data set on financial openness.

Data on inflation, end of period consumer prices (annual %), GDP (current US\$) and population (persons) are obtained from the World Economic Outlook (WEO) database of the IMF.

To facilitate our data analysis process, we resort to the use of Stata 12.0 statistical package. The Stata programme is well known for its precision in the analysis of panel data models and their associated specification tests.

Conclusion

In summary, this chapter describes the theoretical foundations of the dynamic GMM estimation model and how we apply it to establish the relationship between portfolio equity flows and growth. We also describe the use of the GLS Random-effects (EGLS) estimator as robustness check of the system GMM estimation. Furthermore, we investigate the determinants of portfolio equity flows in SSA using the system GMM estimation model. The chapter also gives a brief description of the variables used in the estimation process and the sources from which the data are drawn. Basically, we collect data from the WDI and WGI databases of the World Bank, WEO database of the IMF and the Chinn-Ito dataset website.

CHAPTER FIVE

ANALYSIS AND INTERPRETATION OF RESULTS

5.1 Introduction

This chapter of the study focuses on the analysis of the data-set in order to achieve the objectives of the study. First, we estimate our panel data-set using the system GMM dynamic panel estimation approach to establish the relationship between economic growth and financial integration in Sub-Saharan Africa.

Second, we examine the impact of two threshold variables, namely, financial development and macroeconomic stability, in the realization of the growth benefits of financial integration in the Sub-Saharan African region. The chapter also gives a detailed explanation of how the estimations are carried out to achieve the above stated objectives of the study. Finally, we present and interpret the results of the data analyses in order to give meaning to the results of the study and facilitate comparative analysis with literature in this area of study.

5.2 Data Description

Panel data of nine (9) variables for a maximum of 14 Sub-Saharan African countries over the period 1996-2010 are gathered from the World Development Indicators and the World Governance Indicators of the World Bank, World Economic Outlook database of the IMF and the Chinn-Ito database. The choice of countries included in the study is based solely on the availability of data.

With regards to the first objective, we follow the approach of Edison et al. (2002) by averaging the variables over a 3-year fixed-length interval to eliminate business-cycle fluctuations and facilitate a medium to long-term analysis. The non-overlapping 3-year

period is sorted as 1996-1998, 1999-2001, 2002-2004, 2005-2007 and 2008-2010, such that there are five observations per country.

The dependent variable in the study is *GDP per capita growth (Growth)* and is measured in percentage (%). The explanatory variables in the study are *logarithm of GDP per capita (Initial income)* measured in 2000 constant US dollars (\$) and is captured at the start of each 3-year period; *logarithm of public spending on education as a percentage of GDP (Initial Schooling)* is used as a proxy for human capital and is measured at start of each 3-year period ; *logarithm of domestic credit to the private sector as a percentage of GDP (Fin Dev)* is used as a proxy for financial sector development; *inflation, measured by annual percentage changes in consumer prices (Inflation)*, is used as a proxy for macroeconomic stability and *portfolio equity, net inflows as a percentage of GDP (IFI)*, is used as a proxy for international financial integration.

5.3 Data Summary

Summary statistics of the panel dataset averaged over a non-overlapping 3-year period from 1996-2010 is presented in Table 5.1 below.

Table 5.1: Summary Statistics of Panel data of Sub-Saharan Africa (System GMM, 1996-2010)

Variable	Observations	Mean	Std. Dev	Min	Max
Country	14	7.5	4.060235	1	14
Years	5	3	1.424425	1	5
Growth	70	1.62846	1.42445	-2.950017	6.363697
Initial schooling	63	0.6537032	0.1457646	0.2861375	0.9785908
Initial income	70	2.871822	0.4594691	2.225758	3.688063
Fin Dev	70	1.306243	0.3595044	0.5870934	2.183568
Inflation	70	5.805881	4.765854	0.2013333	28.11933
IFI	70	0.0039673	0.0100212	-0.0047794	0.0606391

Source: Author's calculation

Table 5.2: Summary Statistics of Panel dataset of Sub-Saharan Africa (EGLS, 1996-2010)

Variable	Observations	Mean	Std. Dev	Min	Max
Country	14	7.5	4.040761	1	14
Years	15	2003	4.330818	1996	2010
Growth	210	1.62846	2.649292	-6110132	10.67965
Edu	146	0.6322423	0.1265633	0.2861375	0.9785908
Fin Dev	210	1.304992	0.359943	0.518788	2.209462
Inflation	210	5.805881	5.604935	-5.009	53.21
TO	208	0.7907645	0.3057466	0.393196	2.028565
IFI	201	0.004145	0.012746	-0.0254133	0.0883298
Political stability	168	-0.1068583	0.7648336	-2.305741	1.185568
Kaopen	210	-0.3611791	1.347138	-1.863972	2.439009

Source: Author's calculation.

5.4. Unit-root test results

Table 5.3: Augmented Dickey-Fuller tests (System GMM)

Variable	Statistic		Probability Value
	Lag Structure	Value	
Growth	Level	23.3507	0.0000
Initial Schooling	Level	8.9040	0.0000
Initial Income	Level	17.9492	0.0000
Fin Dev	Level	9.0653	0.0000
Inflation	Level	11.8200	0.0000
IFI	Level	15.7914	0.0000

Note: Statistical values reported are based on the modified inverse chi-squared Pm (including time trend).

Table 5.4: Im-Pesaran-Shin Unit-root test (System GMM)

Variable	Statistic		Probability Value
	Lag Structure	Value	
Growth	Level	-16.8348	0.0000
Initial Schooling	Level	-	-
Initial Income	Level	-5.7446	0.0000
Fin Dev	Level	-46.2378	0.0000
Inflation	Level	-7.4085	0.0000
IFI	Level	-2.9207	0.0017

Note: initial schooling is not tested due to the problem of insufficient observations.

As outlined above, before carrying out the empirical estimations, we undertake a panel data unit-root test to ascertain the stationarity or otherwise of the panel data-set. The unit-root test is conducted on the null hypothesis that all panels contain unit-roots. Table 5.3 presents the results of the augmented Dickey-Fuller (ADF) test for unit-root, which suggests that we fail to accept the null hypothesis for tests in all the variables. This implies that at least one of the panels in the data-set is stationary. In order to check the robustness of the ADF test, we carry out the Im-Pesaran-Shin (IPS) test, whose results are captured in Table 5.4. The IPS test also confirms the ADF test that at least one panel is stationary. The panel data-set can therefore be said to be stationary and free from issues of time-series processes.

To empirically test the null hypothesis that portfolio equity flows have no robust relationship with economic growth in Sub-Saharan Africa, we carry-out two empirical estimations; the system GMM dynamic panel estimation model and the GLS Random-Effects (EGLS) estimator.

5.5 System GMM Estimation Results

The results of the baseline growth regression of the system GMM dynamic panel model are presented in Table 5.4 below.

Table 5.5: System GMM dynamic panel estimation result (1996-2010)

Dependent variable: Growth

Independent variable	Coefficient	Standard Error
<i>Initial Income</i>	-0.7825 (-0.98)	0.7950
<i>Initial schooling</i>	-1.4551 (-1.47)	0.9871
<i>Fin Dev</i>	3.0674 (2.63)	1.1681
<i>Inflation</i>	-0.0227 (-0.32)	0.0705
<i>IFI</i>	53.0334 (14.73)	3.6004
Observations:	50	
Number of Groups:	14	
Number of instruments:	14	
Sargan test p-value:	0.3857	
AR (1) p-value:	0.2664	
AR (2) p-value:	0.3786	

Note: Arellano-Bover/Blundell-Bond estimation, two-step system GMM results, at 5% significance level; t-values in parenthesis.

From Table 5.5, the results of the system GMM model suggests that *initial income* retains a negative sign although it does not enter the model significantly at a 5 percent (%) level of significance. Similarly, *Inflation* retains the expected sign although it does not appear statistically significant in the model at a 5 percent significance level. *Initial schooling*, on the other hand, records a wrong sign although it does not enter the model significantly. *Fin Dev* enters the model with a significant positive coefficient at a 5 percent significance level. This outcome confirms the earlier findings by Spears (1992), King and Levine (1993), Levine and Zervos (1996) whose studies suggest that financial development foster economic growth. It stands to suggest that domestic credit to the private sector plays a significant role in promoting economic growth in Sub-Saharan Africa. A *Fin Dev* coefficient 3.0674 implies that a proportionate increase in domestic credit to the private sector will lead to about 306.74 percent increase in economic growth.

IFI, the proxy for financial integration enters the model with a significantly strong positive coefficient at a 5 percent level of significance. This is consistent with the theoretical expectation of a positive relationship between financial integration and economic growth, and supports earlier studies such as Summers (2000), Quinn et al. (2001), Klein and Olivei (2006) and Mougani (2012). The results suggest that portfolio equity, net inflows is positively correlated with economic growth in Sub-Saharan Africa. An IFI coefficient of 53.033 suggests that, a proportionate increase in the degree of financial integration will result in a 5303.3 percent increase in economic growth. The implication is that, the higher the net inflows of portfolio equity into the Sub-Saharan African region the greater the probability of economic growth in the sub-region. In other words financial integration promotes growth in SSA. This is because as portfolio equity inflows increases, it tends to complement domestic savings, thereby increasing the stock

of investable funds available to the domestic entrepreneurs. Furthermore, increased portfolio inflows tend to reduce the cost of capital since investable funds are readily available, thereby reducing the cost of doing business. These notwithstanding, excessive inflows may expose countries to crisis during periods of sharp reversals, given the relatively volatile nature of portfolio equity.

Post-estimation Test results

To check the accuracy of the system GMM estimator, we test for the presence of autocorrelation and the validity of the instruments employed in the estimation. The results of these tests are also reported in Table 5.5 above.

The autocorrelation test is conducted on the null hypothesis that there is no autocorrelation in the data set. From Table 5.5, the results report a probability value (p-value) of 0.2664 for the autoregressive order one [AR (1)] process. Since the reported value is greater 0.05 we fail to reject the null hypothesis for AR (1) However, the test on the AR (1) process is not reliable due to problems associated with its construction in the system GMM model.

More importantly, we carry out a similar test on the AR (2) process which is relatively reliable and also capable of detecting autocorrelation at levels. The AR (2) test results in Table 5.5 report a p-value of 0.3786, which is greater than the conventional 0.05 benchmark, so we fail to reject the null hypothesis of no autocorrelation. We can therefore conclude that there is no autocorrelation in the system GMM estimation model and therefore the estimator is efficient.

The Sargan test is also conducted to ascertain the validity of the instruments used in the system GMM estimation. The test is carried out on the null hypothesis that, the over-identifying restrictions are valid. From the results presented in Table 5.5 above, the

probability value of 0.3857 is greater than 0.05, so we fail to reject the null hypothesis and conclude that the over-identifying restrictions are valid. This implies that the instruments used in the system GMM estimation are valid instruments and also the instruments as a group are exogenous.

5.6 Robustness check of estimation results

To check for the robustness of the system GMM estimation results, we also analyze our panel data-set using the Random effects-GLS (EGLS) estimator. The results of the EGLS estimation are presented in Table 5.6 below.

Table 5.6: Random Effects-GLS and Pooled-OLS estimation results(1996-2010)

Dependent variable: Growth		
Independent Variable	Random Effects-GLS	Pooled-OLS
<i>Initial schooling</i>	-0.8805616 (-0.51)	-0.8805616 (-0.51)
<i>Fin Dev</i>	1.851865 (2.49)	1.851865 (2.49)
<i>Inflation</i>	0.0397256 (1.11)	0.0397256 (1.11)
<i>Trade Openness (TO)</i>	1.025965 (1.49)	1.025965 (1.49)
<i>IFI</i>	-19.60833 (-0.92)	-19.60833 (-0.92)
<i>Constant</i>	-1.694262 (-1.27)	-1.694262 (-1.27)
Observations	139	139
Number of Groups	14	-
R-squared (adjusted)	0.0797	0.0451
Hausman specification Test	0.3062	-
Breusch-Pagan Test for heteroskedasticity	1.0000	0.0552
Wooldridge Test for autocorrelation	0.2805	0.2805

Note: Random effects-GLS estimation with standard error at 5% significance level; t-values in parenthesis; p-values of diagnostic tests are reported.

From Table 5.6, the results of both the EGLS and the pooled-OLS suggest that, initial schooling and inflation do not retain their theoretical expected signs, although they do not enter the models significantly. On the other hand, financial development retains the expected sign and enters both the EGLS and pooled-OLS models significantly at a 5 percent significance level. This is a confirmation of the theoretical expectation of the effect of financial development on economic growth. This result also supports the empirical findings by Spears (1992), King and Levine (1993), Levine and Zervos (1996) and Ghirmay (2004). Financial development has a coefficient of 1.8518 implying that, a proportionate increase in the level of financial development will lead to a corresponding 185.18 percent improvement in the growth rate of real GDP per capita. In other words, the data suggests that, an improvement in the financial intermediation process will yield about 185.18 percentage increase in economic growth in the sub-region. This gives an indication that; the implementations of policies to further deepen and liberalize the financial markets are likely to improve domestic credit to the private sector, which in turn reduce the cost of borrowing. This will encourage entrepreneurs to undertake production activities and which will ultimately promote economic growth. Trade openness also maintains the right sign but does not enter the model significantly at a 5 percent significance level.

Our variable of interest, financial integration (IFI), does not enter the model significantly at a 5 percent significance level. In other words, the data set suggests that, financial openness in Sub-Saharan Africa no significant relationship with economic growth. This outcome, however, is no surprise given the relatively volatile nature of portfolio equity and the little attention given to it in the SSA sub-region compared to FDI (ODI, 2009). The implication of this IFI-growth relationship is that, the current degree of financial openness in SSA does not promote economic growth.

Prior to settling on the Random effects-GLS model, we estimate the panel data-set using both the fixed effects model and the random effects model. We then conduct the Hausman specification test to select the appropriate estimation model. The Hausman specification test yielded a p-value of 0.3062, greater than the conventional 0.05 benchmark. This suggests that, we fail to reject the null hypothesis that there is no significant difference between the EGLS estimator and the fixed effects estimator and conclude that, the EGLS is a consistent and efficient estimator. We therefore choose the EGLS estimator ahead of the fixed effects estimator.

Furthermore, we conduct diagnostic tests to ascertain the appropriateness of the Random effects-GLS estimator. We begin by conducting the Breusch-Pagan LM test for random effects. From Table 5.6, the estimation yields a p-value of 1.0000, which is greater than the conventional 0.05, so, we fail to reject the null hypothesis of homoskedasticity. In other words, we conclude that the model is homoskedastic. The implication is that, the explanatory variables are neither correlated with the error terms (ε_{it}) nor the country specific time-invariant observations (η_i).

Similarly, the results of the LM test can be interpreted differently. Given that we fail to reject the null hypothesis, literature suggests that we employ the Pooled-OLS estimator since there is no significant difference across units. In other words, there is no panel effect in the model so the EGLS estimator becomes an inefficient estimator at this instance. However, theory suggests the Pooled-OLS estimator may not be the most efficient estimator due to the problem of autocorrelation (Green, 2012, pg. 372). The EGLS estimator is rather a more efficient estimator. However, for the sake of clarity, we report the results of both the EGLS estimator and the pooled-OLS, although the two estimations results are similar. This notwithstanding, we proceed to test for heteroskedasticity in the pooled-OLS model using the Breusch-Pagan test for

heteroskedasticity. As reported in Table 5.6, the test yields a p-value of 0.0552, which is greater than the conventional 0.05 benchmark. We fail to reject the null hypothesis of constant variance, and conclude that, the model is homoskedastic.

We test for the presence of autocorrelation in the EGLS model by conducting the Wooldridge test for autocorrelation. As reported in Table 5.8, the Wooldridge test for autocorrelation yields a p-value of 0.2805 which is greater than the conventional 0.05 benchmark. We therefore fail to reject the null hypothesis and conclude that, there is no first order autocorrelation in the model. Similarly, a test for autocorrelation in the pooled-OLS model using the Wooldridge test yields the same result as the EGLS. We therefore conclude that, there is no first order autocorrelation in both the EGLS and the pooled-OLS models.

5.7 Synthesis of the Results

At this juncture, the study compares the results of the system GMM dynamic panel model and the results of the robustness check models (EGLS and the pooled-OLS) in order to make a meaningful inference about the results of the study.

By comparing the results of the System GMM dynamic model with the results of the EGLS and pooled-OLS, the results are in sharp contrast to each other. Thus, the system GMM dynamic model suggests a significant positive IFI-growth relationship, while the Random effects-GLS (EGLS) model on the other hand suggests a significant negative IFI-growth relationship. Since the results of the IFI-growth relationship differ based on the empirical models employed, the study is unable to establish any definite relationship between financial integration and economic growth in Sub-Saharan Africa. This outcome confirms the findings of a related study by Deléchat et al. (2009). This, however, does not imply that there is neither a positive nor a negative relationship between financial

integration and economic growth in SSA. But instead, the study finds no robust relationship between financial integration and economic growth in Sub-Saharan Africa. The basis of our argument is along the lines of the results of the two empirical estimation models employed in our analysis of the data-set.

On the basis of the analysis made so far, we fail to reject the null hypothesis that portfolio equity flows have no robust relationship with economic growth in SSA at a 5 percent significance level. At best, the data set suggests there is a mixed relationship between financial integration and economic growth in Sub-Saharan Africa.

5.8 Results of the Determinants of Portfolio equity flows

The results of the determinants of portfolio equity flows in Sub-Saharan Africa are presented in Table 5.7.

Table 5.7: System GMM dynamic panel estimation result (1996-2010)**Dependent variable: IFI**

Independent variable	Coefficient	Standard Error
<i>Growth</i>	5.99E-06 (0.04)	0.000134
<i>Edu</i>	-0.0169 (-1.93)	0.0087
<i>Fin Dev</i>	0.0212 (6.62)	0.0032
<i>Inflation</i>	7.77E-05 (0.78)	9.98E-05
<i>TO</i>	-0.0220 (-5.31)	0.0041
<i>Political Stability</i>	-0.0041 (-4.14)	0.0010
<i>Kaopen</i>	-0.003 (-1.43)	0.0027
Observations:	101	
Number of Groups:	14	
Number of instruments:	74	
AR (1) p-value:	0.2256	
AR (2) p-value:	0.2969	
Sargan test p-value:	1.0000	

Note: Arellano-Bover/Blundell-Bond estimation, two-step system GMM estimation results, at 5% significance level; t-values in parenthesis.

From Table 5.7, the *Growth* variable retains the theoretically expected positive sign although it is not significant in the estimation model. *Edu* the proxy for human capital development retains a negative sign contrary to the expected sign; nonetheless, it does not enter the model significantly.

Inflation also maintains a positive sign in sharp contrast to the expected sign, although it is not significant in the model. *Kaopen* retains a negative insignificant sign in the estimation model. This outcome suggests that the presence or otherwise and the extent of capital controls in SSA are does not play a significant role attracting portfolio equity to the sub-region.

Fin Dev the proxy for financial development retains a positive and significant coefficient as expected at a 5 percent significance level. This suggests that, improvements in the financial intermediation process in the region are positively associated with portfolio equity flows into SSA. A *Fin Dev* coefficient of 0.0212 implies that a proportionate improvement in financial development will lead to about a 2.12 percent (%) increase in portfolio equity flows to the sub-region. This outcome confirms the earlier findings by Bailliu (2000) that financial development plays a significant role in attracting private capital to foster economic growth.

TO(trade openness) on the other hand, retains a significant negative coefficient contrary to the theoretical expectation and confirming the results of Portes and Rey (2005).Portes and Rey (2005), further suggest that trade openness as a determinant of portfolio equity flows to a larger extent is influenced by geographical components. However, the trade openness variable in this study suggests that high levels of trade with the international community will rather limit or reduce the amount of portfolio equity flows in the SSA region. A possible explanation for this relationship is that, SSA countries may be importing more goods and services than they export to the international community. Therefore, higher levels of trade openness facilitate the outward flow of capital from the SSA region.A coefficient of -0.0220 implies that a proportionate increase in international trade activities will lead to about 2.20 percent reduction in portfolio equity flows into SSA.

Political stability assumes a negative sign and enters the model significantly at a 5 percent significance level. This result is in sharp contrast to the findings of Barro (2003) that increases in democracy and rule of law encourages investment and growth.

The results of the current study suggests that the current state of political stability and institutional development in SSA to a greater extent have not attracted portfolio equity flows to the region. A *political stability* coefficient of -0.0041 implies that a proportionate improvement in political stability rather leads to a 0.4 percent decline in portfolio equity flows to the SSA region. A possible explanation for this relationship is that, as SSA countries become stable democracies the problem of mismanagement in government and corruption increases, thereby sending a bad signal to global investors.

5.9 Robustness Check of the results of the determinants of portfolio equity flows

To check for the robustness of the results of the determinants of portfolio equity flows in SSA, replicate the analysis using the Random effect-GLS (EGLS) approach to panel data analysis. The result of the EGLS estimation is presented in Table 5.8.

Table 5.8: Random Effects-GLS estimation result (1996-2010)

Dependent variable: IFI		
Independent Variable	Coefficient	Standard Error
<i>Growth</i>	-1.905E-04 (-0.60)	0.000315
<i>Edu</i>	-0.0033 (-0.49)	0.0067
<i>Fin Dev</i>	0.0178 (3.42)	0.0052
<i>Inflation</i>	2.514E-04 (1.50)	0.000167
<i>TO</i>	-0.0066 (-1.30)	0.0051
<i>Political stability</i>	-4.871E-04 (-0.28)	0.0017
<i>Kaopen</i>	-0.0015 (-1.30)	0.0012
<i>Constant</i>	-0.0136 (-1.48)	0.0092
Observations	112	
Number of Groups	14	
R-squared (overall)	0.4219	
Hausman specification Test	0.9380	
Breusch-Pagan Lm Test	0.0000	
Wooldridge Test for autocorrelation	0.0596	

Note: Random effects-GLS estimation with standard error at 5% significance level; t-values in parenthesis; p-values of diagnostic tests are reported.

From Table 5.8, *Growth* retains a negative sign contrary to the result of the system GMM, although it does not enter the model significantly. Similarly, *Edu* and *Inflation* do not maintain the expected signs and are not significant at a 5 percent significance level.

The *Kaopen* coefficient confirms the result of the system GMM estimation as it maintains a negative but insignificant coefficient at a 5 percent significance level. The *TO* (trade openness) and *Political stability* coefficients maintain negative signs just as in the system GMM estimation result but, they do not enter the model significantly at a 5 percent significance level.

Fin Dev retains a positive and significant coefficient at a 5 percent significance level, a clear confirmation of the system GMM estimation result. It therefore stands to suggest that the degree of financial intermediation in the SSA region plays a significant role in attracting portfolio equity flows into the sub-region. A coefficient of 0.0178 suggests that proportionate improvement in the financial intermediation process will lead about 1.78 percent increase in portfolio equity flows to Sub-Saharan Africa.

Overall, an r-squared of 0.4219 implies that the model explains about 42.19 percent of the variation in portfolio equity flows to the sub-region.

Apost-estimation Hausman specification test yields a result of 0.9380, greater than the conventional 0.05 benchmark. This gives an indication that the study should choose random effect-GLS over fixed effects. Breusch and Pagan Lm test for random effects yields a result of 0.0000. Since the estimated statistic is less than the conventional 0.05 benchmark, we reject the null hypothesis that variances across entities are zero and conclude that there is significant difference across units (panel effect) in the model. This outcome validates the use of the random effect-GLS model in the analysis.

The test Wooldridge test for autocorrelation yields a probability value of 0.0596. Since 0.0596 is greater than the conventional 0.05, we fail to reject the null hypothesis of no first order autocorrelation and conclude that there is no presence of autocorrelation in the model.

Conclusion

This chapter of the study analyzes the panel data-set of 14 countries to ascertain the relationship between financial integration (IFI) and economic growth in the Sub-Saharan African region. We also presented and discussed the results of the data analysis in order to give meaning to the results and facilitate comparison with other related literature.

Before estimating our baseline regression, we conducted a unit-root test to ascertain the stationarity or otherwise of the panel data-set. The results by both the augmented Dickey-Fuller (ADF) test and the Im-Pesaran-Shin (IPS) unit-root test confirmed the stationarity of panel data-set. In our quest to investigate the relationship between financial integration and economic growth, the study analyzed the data-set by employing the System GMM dynamic panel estimation model.

The results of the system GMM model suggest that both financial development and financial integration have a significant positive relationship with economic growth. To check the robustness of the system GMM model results, we estimate the panel data set using the Random Effects-GLS (EGLS) estimator. Interestingly, the EGLS estimator result contradicts the system GMM estimation result as it suggests that there is a negative insignificant relationship between IFI and economic growth. However, the EGLS estimator confirms that there is a significant positive relationship between financial development and economic growth in SSA.

However, on the basis of the contradiction and the inconsistency of the results of the system GMM and the Random effects-GLS models, the study concludes that there is no robust relationship between financial integration and economic growth in the Sub-Saharan African region.

Furthermore, the study examines the determinants of portfolio equity flows in Sub-Saharan Africa. The study finds a robust significant positive relationship between portfolio equity flows and financial development in the sub-region. This suggests that financial development plays an important role in attracting portfolio equity flows to SSA.

The study also finds that trade openness and political stability have significant negative relationship with portfolio equity flows although not robust.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This is the concluding chapter of the study. This chapter gives a summary of all what the study is about and how the study was conducted. On the basis of the outcome of the study, we draw conclusions and make recommendation for policy analysis and further studies in this area of study. Furthermore, we identify the limitations of the study to guide future studies on the subject matter.

6.2 Summary of the Study

The focus of the study is to investigate the relationship between financial integration and economic growth in Sub-Saharan Africa using a sample of 14 countries over the period 1996-2010. The distinguishing feature of this study from other literature in the Sub-Saharan African region is the use of portfolio equity, net inflows as a proxy for financial integration. The choice of portfolio equity as a proxy for financial openness is due to its relatively volatile nature, compared to private capital flows and FDI. To achieve the objective of establishing the relationship between portfolio equity flows and economic growth, we employ two estimation models; one being the main model and the other being a robust check of the main model. We first estimate the baseline growth regression using the system GMM dynamic panel model, while controlling for initial income, human capital and other financial and economic factors.

The results of the system GMM model confirm the theoretical expectation that both financial development and financial integration have a significant positive relationship with economic growth in SSA. To check for the consistency of the system GMM model results, we analyze the data set again using the Random effects-GLS (EGLS) model. Contrary to the system GMM results, the results of the EGLS model suggest that there

exists a negative insignificant relationship between portfolio equity flows and economic growth. However, the EGLS estimator confirms that there exists a significant positive relationship between financial development and economic growth. Due to the inconsistency in the results of the two estimation models we fail to reject the null hypothesis that portfolio equity flows have a robust relationship with economic growth in Sub-Saharan Africa.

The dataset therefore suggests that there is no definite or robust link in the IFI-growth relationship in SSA. At best, the study finds that there exists a mixed relationship in the IFI-growth nexus in SSA.

The study also examines the determinants of portfolio equity flows in Sub-Saharan Africa. The study finds a significant positive relationship between financial development and portfolio equity flows although this relationship is also robust across the system GMM and the EGLS methodologies. The study also finds that trade openness and political stability have a significant negative relationship with portfolio equity flows in SSA. The negative relationship between trade openness and political stability, and portfolio equity flows however are not robust across the system GMM and the EGLS methodologies.

In sum, the key findings of the study suggests that there is no robust relationship between portfolio equity flows and economic growth in Sub-Saharan Africa although there exists a significant positive relationship between financial development and economic growth. In the case of the determinants of portfolio equity flows to the SSA region, the study finds that financial development is a robust determinant of portfolio equity flows to the Sub-Saharan African region. However, trade openness and political stability are found

not to be robust determinants of portfolio equity flows to the Sub-Saharan African region.

6.3 Conclusion of the Study

The debate on the relevance of financial integration to economic growth continues to engage the attention of some economists in the academic circles. The theoretical benefits of financial integration are extensively captured in literature. However, the empirical evidence of the benefits of financial integration still remains doubtful and inconclusive, as some studies find positive, negative and even mixed or no definite relationship between financial integration and economic growth. Literature suggests that, the inconclusive financial integration-growth relationships can partly be attributed to the inconsistencies in the conduct of empirical studies. For instance, a variety of estimation methods have been employed, various measures of financial openness (dejure, defacto and price-based measures) are adopted and different proxies have been used to measure financial openness. These inconsistencies have made it difficult to compare empirical findings to arrive at a definite conclusion.

The relevance of the financial integration-growth nexus for developing economies such as Sub-Saharan Africa cannot be overemphasized. The countries in the sub-region experienced spontaneous reversal in portfolio equity flows in the early 2000s and more recently in 2008, following the financial turmoil in the United States of America (U.S.A.). These reversals in portfolio equity flows raise concerns as to the extent to which SSA countries are integrated into the global financial market in order to avert financial crisis and other macroeconomic volatilities.

With these developments in mind, the current study seeks to investigate the relationship between financial openness and economic growth in SSA. Using portfolio equity flows

as a proxy for financial openness, the study finds that although capital account liberalization is positively associated with economic growth, the data-set does not support the view that there is a robust relationship between financial integration and economic growth in Sub-Saharan Africa. The findings of the study confirm the findings of earlier studies on Sub-Saharan Africa by Ahmed (2011) and Mougani (2012).

The possible explanation for the absence of a robust link between financial openness and economic growth may be attributed to the fact that most SSA countries are deficient in the necessary prerequisites or threshold conditions for effective financial integration. These necessary threshold conditions are developed financial markets, stable macroeconomic environment, political stability, good governance, and better institutional and regulatory frameworks. Other relevant conditions include political stability, rule of law, and control of corruption. The deficiency is manifest in the insignificant coefficients of most of the control variables included in the study. As literature suggests, the pursuit of financial openness without the necessary threshold conditions can cause macroeconomic instability as large capital inflows lead to an expansion of the monetary base of an economy beyond the target of the monetary authorities. The aftermath is excess money supply and its associated inflationary pressures on the economy.

Similarly, Obstfeld and Taylor (2003) suggest that financial openness without these prerequisites can bring about excessive capital inflows, leading to the appreciation of the domestic currency against the major trading currencies. Consequently, exports become relatively expensive than imports, leading to a decline in exports and a widening of the current account deficit.

Furthermore, the pursuit of financial openness without the necessary prerequisites also exposes SSA countries to problems such as capital flight and contagion. For instance, in

the case of capital flight, weak institutions and poor regulatory frameworks will facilitate large inflows and sharp reversals of portfolio equity flows in instances of tax increases, inflationary problems and civil strife in an economy. Weak and corrupt judicial systems are likely to discourage foreign investors from undertaking capital investments in the region and even force resident foreign investors to exit the region. This is because the investors will lose confidence in a corrupt judicial system to enforce the property rights laws, which happens to protect their investment. The investors will then resort to liquid, short-term investments that they can easily repatriate at the slightest hint of trouble in the sub-region. The consequence will be the problem of macroeconomic volatility in the SSA region.

Similarly, in the case of financial contagion, poor institutional frameworks will facilitate the free flow of large stocks of capital across international borders due to events or shocks from other parts of the world. That is, weak or virtually non-existing regulatory and supervising frameworks will lead to unregulated flow of capital to and from the sub-region. The aftermath will be distortions in production and consumption patterns in the region.

Poor supervision of the financial system may also risk an infiltration of the domestic financial system by foreign banks. This could take the form of either foreign direct investment or portfolio equity investment in already existing domestic banks. The entry of foreign banks can lead to the process of concentration, where foreign banks can acquire local banks and become the single largest operator or create some sought of monopoly power in the banking industry. They then tend to ration credit to a small group of creditworthy corporate borrowers, at the expense of the vast majority in productive economic activities, regardless of the economic relevance of the activities of these borrowers. Furthermore, the foreign banks are also recipients of huge capital inflows

from their mother banks abroad for investment in liquid, short-term securities as they seek to diversify their risk globally. The tendency from these large capital flows to shuttle to and from the sub-region raises concerns about the problem of macroeconomic volatility.

In investigating the determinants of portfolio equity flows in SSA, the study finds that financial development, trade openness and political stability have significant impacts on portfolio equity flows in the sub-region, although trade openness and political stability exert negative impacts. The negative impact of trade openness on portfolio flows may be attributed to the fact that the region imports more goods and services than it exports. Therefore, the flow of capital outside the region exceeds capital receipts from exports. The excessive imports have the tendency of depreciating the value of the domestic currencies against the major trading currencies. The issue of balance of trade deficit can also worsen the current account balance of SSA countries as excessive imports reduce their net foreign assets.

Similarly, the negative impact of political stability may be attributed to the economic mismanagement and corrupt practices of some democratically elected governments in SSA. Some government officials enter into shady deals which divert state resources to non-priority areas in order to satisfy their selfish needs. Also, poor accountability on the part of government leaves much to be desired as projects undertaken are not accurately accounted for. The result is the depletion of government revenue after which the government will seek to raise revenue again through tax increases and loans. The incidence of poor accountability and corruption on the part of some government creates a bad reputation for individual countries and the sub-region as a whole in the area of accountability. This has the tendency of discouraging portfolio equity flows to SSA since

investors will have doubt about national policies on financial reporting and accountability.

6.4 Recommendations for policy analysis and further studies.

The study of the impact of financial integration on economic growth in developing economies, especially Sub-Saharan Africa, is of importance to researchers and policymakers due to its policy relevance and the variety of econometric methodologies and proxies of financial openness employed in the analysis.

Until recently, most of the studies on financial openness were done for advanced economies; however, the need for threshold conditions (prerequisites) prior to financial openness has shifted much attention to developing economies.

On the basis of the findings of the study, we propose that policymakers in the Sub-Saharan African region should adopt a cautious approach to the financial integration process, since the study found no robust link between financial openness and economic growth. Again, most of the threshold conditions were found not to be crucial in the financial integration-growth relationship. This sharply contradicts suggestions by literature that crucial threshold conditions should be in place prior to the pursuit of financial openness. Specifically, policies aimed at enhancing financial development should consider the regulation of the activities of foreign banks and their receipts of portfolio equity inflows. Despite the innovation and competition they bring to the domestic market, the foreign banks tend to be the recipients of huge portfolio flows from their mother banks abroad for investment in liquid assets. Prudent monitoring and regulation of such banks will reduce the incidence of macroeconomic volatility caused by volatilities in portfolio equity flows and help the monetary authorities to achieve their inflationary targets.

Financial sector regulators should also take a keen interest in analyzing mergers and take-over bids by foreign banks in order to avoid concentration or near monopoly by foreign banks in order to avoid credit rationing. Financial sector regulators should also acquaint themselves with the latest financial instruments and reporting standards in order to be able to effectively monitor foreign banks and the financial system as a whole.

Furthermore, policymakers should pursue policies that will facilitate financial market liberalization to enable market-determined interest rates to distribute credit in the region. These financial liberalization policies will also encourage innovation, promote healthy competition among market operators and foster the overall development of the financial system.

Bold initiatives on the part of governments to develop the domestic capital markets will tend to reduce the overly reliance on foreign capital for investment purposes. For instance, governments can give incentives to companies who list on either the stock or corporate bond markets to entice companies to opt for that option of financing. Financing from the stock and bond markets are relatively cheaper and are long-term in nature.

Policymakers in SSA countries should initiate policies that will compel governments to spend within their budgets, in order to ensure fiscal discipline and reduce inflationary pressures. Such policies have the tendency of reducing issues of government budget deficits which often counteract the efforts of the monetary policy authorities and also increase the debt stock of a country. Curbing the problem of budget deficits will reduce the tendency for the government to issue sovereign bonds which eventually crowd-out private enterprises in the capital market.

Governments should initiate export promotion policies to encourage the export of goods and services in order to increase a country's net foreign assets. Policies protect domestic

companies and encourage the establishment of import-substitution industries in order to reduce importation of goods and services. Governments can also create a friendly environment for exporters to negotiate with their foreign trade partners in order to arrive at favourable terms of trade, which have the tendency of improving receipts (revenue) from exports.

A more transparent judicial system willing to ensure the rule of law will encourage long-term investment and reduce spontaneous reversals of capital flows across international borders. This is because foreign investor community will begin to have confidence in the domestic judicial system to enforce the property rights laws which will seek to safeguard their investments. Similarly, the ability of the judicial system to ensure rule of law will hold governments accountable for their actions, reduce corruption and promote good governance. Furthermore, transparent judicial systems will encourage politicians to channel all their grievances to the judiciary for redress instead of resorting to conflict and wars. This will promote political stability and deepen democratic governance in the Sub-Saharan African region. Consequently, the region will be touted as a safe destination for long-term investment.

It is worth noting that as literature suggests, until these policy recommendations are effectively implemented any attempt to liberalize the capital account of Sub-Saharan African countries, exposes the region to financial crisis and its associated macroeconomic volatilities. The study recommends that policymakers should take keen interest in re-examining the financial systems, macroeconomic policies, institutional and regulatory frameworks and the judicial system.

As was the case of China and India and recommended by the IMF in its May, 2005 press release, we also advocate the temporary imposition of capital control tools to restrict

capital flows across borders. As observed by Prasad and Rajan (2008), not all countries are ready for financial integration, especially developing countries, though some countries may want to liberalize to improve their institutions. We therefore advocate that the approach towards capital account liberalization in Sub-Saharan Africa should be gradual or sequenced in order to avoid financial crisis and macroeconomic volatility. This is because financial integration as a whole puts a great deal of pressure on other policies and structural features of an economy.

6.5 Directions for future studies.

With regards to the current study, future research works should be directed at investigating whether the financial integration-growth relationship is statistically significant at specific threshold levels for all the threshold conditions at the same time.

Similarly, future studies should investigate whether or not there exists a trade-off amongst the threshold variables; such that, the specific level of one variable neutralizes or negates the impact of the other variable(s) in the financial openness-growth nexus. Furthermore, future studies should investigate whether or not the levels of the threshold conditions do vary with time as the SSA countries become more financially integrated over time.

6.6 Limitations of the Study.

The study is limited to only 14 countries in Sub-Saharan African although there are 45 countries in the sub-region. This is due to the problem of data availability for all the SSA countries. In the case of the system GMM dynamic panel model, averaging annual data over a 3-year period may have concealed (lost) relevant information for the study. However, the averaging is done to eliminate the effect of business cycles. Technically, averaging the panel data over a 3-5 year period reduces the number of instruments used

relative to the number of groups in the system GMM model, which is desirable for efficient estimation (Stata Journal, 2009).

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APPENDICES

Appendix A

Unit root tests

Table 1A: Augmented Dickey-Fuller tests

Variable	Statistic		Probability Value
	Lag Structure	Value	
GDP growth	Level	14.4990	0.0000
Edu	Level	4.3079	0.0000
Fin Dev	Level	2.5420	0.0055
Inflation	Level	25.2097	0.0000
Trade Openness	Level	2.1733	0.0149
Political Stability	Level	9.5581	0.0000
Kaopen	Level	35.0954	0.0000
IFI	Level	9.6316	0.0000

Source: Author's calculation.

Note: Statistical values reported are based on the modified inverse chi-squared Pm.

Table 1B: Phillips-Perron unit-root tests

Variable	Statistic		Probability Value
	Lag Structure	Value	
GDP growth	Level	14.4990	0.0000
Edu	Level	4.3079	0.0000
Fin Dev	Level	2.5420	0.0055
Inflation	Level	25.2097	0.0000
Trade Openness	Level	2.1733	0.0149
Political Stability	Level	9.5581	0.0000
Kaopen	Level	35.0954	0.0000
IFI	Level	9.6316	0.0000

Source: Author's calculation.

Note: Statistical values reported are based on the modified inverse chi-squared Pm.

Table 1C: Im-Pesaran-Shin Unit-root test

Variable	Statistic		Probability Value
	Lag Structure	Value	
Growth	Level	-5.9044	0.0000
Edu	-	-	-
Fin Dev	Level	-2.9795	0.0014
Inflation	Level	-7.3584	0.0000
Trade Openness	Level	-2.3794	0.0087
Political Stability	Level	-2.0295	0.0212
Kaopen	Level	-7.5035	0.0000
IFI	Level	-5.0169	0.0000

Source: Author's calculation.

Note: Initial schooling is not tested due to the problem of insufficient observations.

Appendix B**Table 3A: Fixed Effects Estimation results****Dependent variable: Growth**

Independent variable	Coefficient	Standard Error
<i>Initial schooling</i>	1.382782 (0.60)	2.210707
<i>Fin Dev</i>	2.332438 (0.94)	2.719759
<i>Inflation</i>	-0.0425692 (-0.71)	0.0908479
<i>Trade Openness (TO)</i>	0.9010345 (0.41)	1.871644
<i>IFI</i>	-5.783311 (-0.21)	14.2833
<i>Constant</i>	-3.23492 (-0.79)	4.731438
Observations	139	
Groups	14	
R-squared (overall)	0.0425	

Source: Author's calculation.

Note: Fixed effects estimation with standard error at 5% significance level; t-values in parenthesis; p-value of diagnostic tests are reported.

Table 3B: Hausman Specification Test Results

Independent V_B)) Variable	Coefficients			
	(b) fixed	(B) random	(b-B) Difference	sqrt (diag (V_b- S.E.
Initial schooling	1.382782	-0.8805616	2.263344	1.528316
Fin dev	2.332438	1.851865	.4805727	2.368253
Inflation	-0.0425692	.0397256	-0.0822948	.0480684
Trade openness	0.9010345	1.025965	-0.1249309	2.077093
IFI	-5.783311	-19.60833	13.82502	17.6693

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

$$\begin{aligned} \text{chi2 (5)} &= (\mathbf{b}-\mathbf{B})' [(\mathbf{V}_b-\mathbf{V}_B)^{-1}] (\mathbf{b}-\mathbf{B}) \\ &= 6.00 \\ \text{Prob}>\text{chi2} &= 0.3062 \end{aligned}$$

Table 3C: Breusch and Pagan Lagrangian multiplier test for random effects

Growth [country, t] = Xb + u [country] + e [country, t]		
Estimated results:		
	Var	sd = sqrt (Var)
Growth	6.329711	2.515892
e	6.021611	2.453897
u	0	0
Test: Var (u) = 0		
chibar2 (01) = 0.00		
Prob> chibar2 = 1.0000		

Source: Author's calculation

Table 3D: Arellano-Bond test for zero autocorrelation in first-differenced errors

Order	Z-Value	Probability Value
AR (1)	-1.1114	0.2664
AR (2)	-0.88051	0.3786

Source: Author's Calculation.

Table 3E: Sargan test of overidentifying restrictions

Chi2 statistic (χ^2)	Probability Value
8.50604	0.3857

Source: Author's Calculation.

Appendix C

Table 4A: Fixed Effects Estimation results

Dependent variable: IFI

Independent variable	Coefficient	Standard Error
<i>Growth</i>	-0.0001746 (-0.53)	0.0003295
<i>Edu</i>	-0.0057884 (-0.79)	0.0073327
<i>Fin Dev</i>	0.008822 (1.00)	0.0088451
<i>Inflation</i>	0.0001881 (1.02)	0.0001837
<i>TO</i>	-0.009237 (-1.29)	0.0071826
<i>Political stability</i>	-0.0007765 (-0.38)	0.0020614
<i>Kaopen</i>	-0.0010878 (-0.59)	0.0018327
<i>Constant</i>	0.0024443 (0.17)	0.0143733
Observations	112	
Groups	14	
R-squared (overall)	0.2375	

Note: Fixed effects estimation with standard error at 5% significance level; t-values in parenthesis; p-value of diagnostic tests are reported.

Table 4B: Hausman Specification Test Results

Independent V_B)) Variable	Coefficients			
	(b) fixed	(B) random	(b-B) Difference	sqrt (diag (V_b- S.E.
Growth	-0.0001746	-0.0001905	0.0000159	0.0000943
Edu	-0.0057884	-0.0033266	-0.0024618	0.0027749
Fin Dev	0.008822	0.0178714	-0.0090494	0.0071372
Inflation	0.0001881	0.0002514	-0.0000632	0.0000757
TO	0.009237	0.0066196	-0.0026175	0.0050552
Political stability	-0.0007765	-0.0004871	-0.0002894	0.0011246
Kaopen	-0.0010878	-0.0015887	0.0005009	0.0013621

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

$$\begin{aligned} \text{chi2 (7)} &= (\mathbf{b}-\mathbf{B})' [(\mathbf{V}_b-\mathbf{V}_B)^{-1}] (\mathbf{b}-\mathbf{B}) \\ &= 2.35 \\ \text{Prob}>\text{chi2} &= 0.9380 \end{aligned}$$

Table 4C: Breusch and Pagan Lagrangian multiplier test for random effects

ifi [country,t] = Xb + u[country] + e[country,t]		
Estimated results:		
	Var	sd = sqrt (Var)
ifi	0.0001314	0.0114632
e	0.0000488	0.0069851
u	0.0000639	0.007993
Test: Var (u) = 0		
chibar2 (01) = 46.53		
Prob> chibar2 = 0.0000		

Source: Author's calculation

Table 4D: Arellano-Bond test for zero autocorrelation in first-differenced errors

Order	Z-Value	Probability Value
AR (1)	-1.2116	0.2256
AR (2)	1.0431	0.2969

Source: Author's calculation

Table 4E: Sargan test of over-identifying restrictions

Chi2 statistic (χ^2)	Probability Value
9.410724	1.0000

Source: Author's calculation

Appendix D

Table 5A: Cross- correlation Matrix

	Growth	Initial Income	Initial Schooling (Edu)	Fin Dev	Inflation	TO	IFI	Political stability	Kaopen
Growth	1.0000								
Initial Income	0.3001	1.0000							
Edu	0.0187	0.2226	1.0000						
Fin Dev	0.2698	0.7341	0.2472	1.0000					
Inflation	0.1296	0.1014	0.0390	-0.0538	1.0000				
TO	0.1826	0.4292	0.2711	0.0974	0.0955	1.0000			
IFI	0.0645	0.4319	0.1377	0.6167	0.0239	-0.0671	1.0000		
Political Stability	0.3339	0.3299	0.0391	0.1908	0.1443	0.0842	0.0458	1.0000	
Kaopen	0.2553	0.1272	0.0271	0.0362	0.5674	0.0474	-0.0982	0.1955	1.0000

Source: Author's calculation.