

FINANCIAL INTEGRATION AND ECONOMIC GROWTH: A CASE OF PORTFOLIO EQUITY FLOWS TO SUB-SAHARAN AFRICA

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 estimated 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. To check for the consistency of the 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. 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. We therefore recommend that policymakers in the SSA should adopt a cautious approach to the financial integration process. Specifically, policies aimed at regulating the activities of foreign banks and their receipts of portfolio equity inflows.

Keywords: Financial Integration, Portfolio Equity, Economic Growth, Sub-Saharan African

Introduction

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 to developing countries. Although neoclassical theory predicts potential benefits of financial integration, empirical evidence of the real benefits on long term macroeconomic growth remains highly controversial (Prasad et al., 2003).

Capital flows may be beneficial to 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 and in more recently, 2013, issued sovereign/Euro bonds to raise a total of about US\$1,950 million and US\$1,225 million respectively (IMF, 2001; 2013). 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 tensions, 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).

Recent studies on financial integration in Sub-Saharan Africa (SSA) by Mougani (2012) and Ahmed (2011) have focused on private capital flows and rule-based measures of financial openness respectively, though their findings have been largely inconsistent in relation to the impact such flow have on growth. However, a critical look at the composition of private capital flows or foreign direct investment (FDI) into developing countries reveals that it constitutes the least volatile, given their long-term and relatively fixed nature (Prasad et al, 2003). Portfolio equity flows, on the other hand, tend to be more volatile and prone to spontaneous reversals (IMF, 2012). 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 most countries. To the best of our knowledge, there is no empirical study analyzing the relationship between portfolio equity flows and economic growth in financial globalization context in Sub-Saharan Africa. The current study empirically examines the effect of financial integration on economic growth in Sub-Saharan Africa with concentration on portfolio equity flows over the period 1996-2010 as the main point of departure from the previous studies.

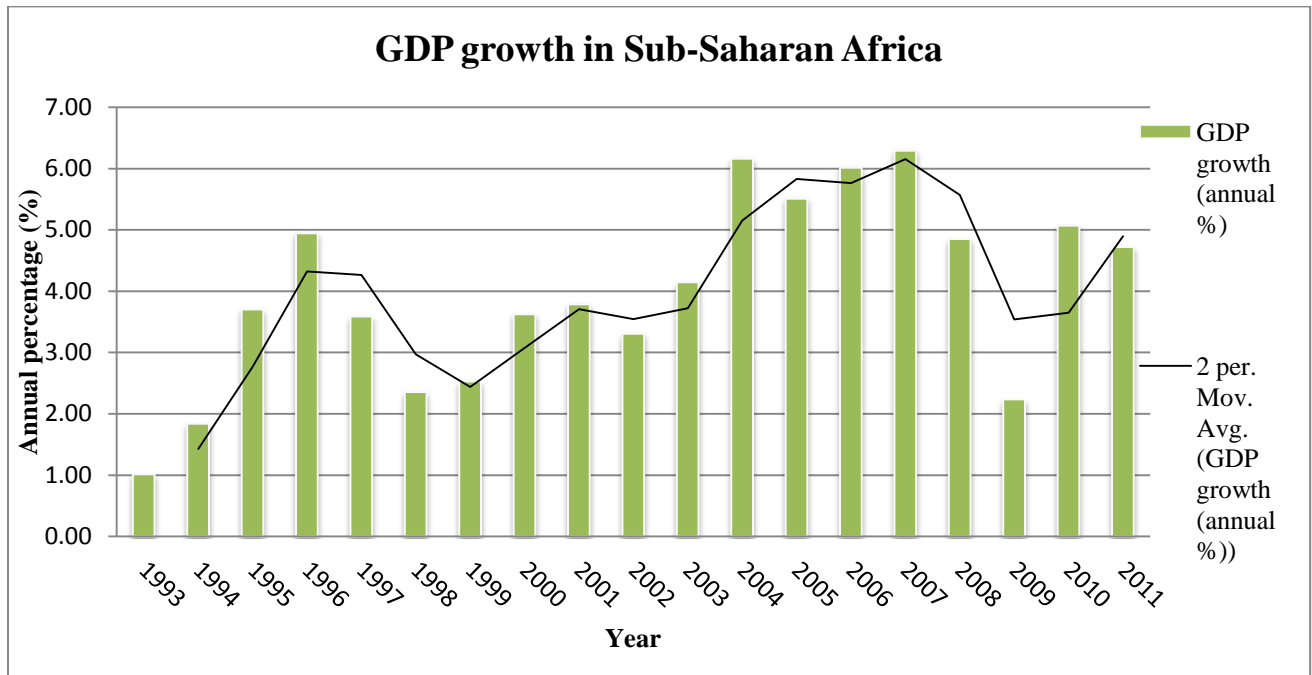
The rest of the paper is organized as follows: Section two presents an overview of recent trend in economic growth and equity flows in the Sub-Saharan African region; Section three reviews related and relevant literature on the topic area; Section four explains the methodology used to analyze the panel data set, and presents the results and the discussions of the panel regression; Section five concludes and summarizes the findings of the study and makes recommendations for policymakers.

2. Trends in Economic Growth Rate and Portfolio Equity Flows in SSA

Trends in Economic 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 1: Sub-Saharan Africa: Trends in GDP growth

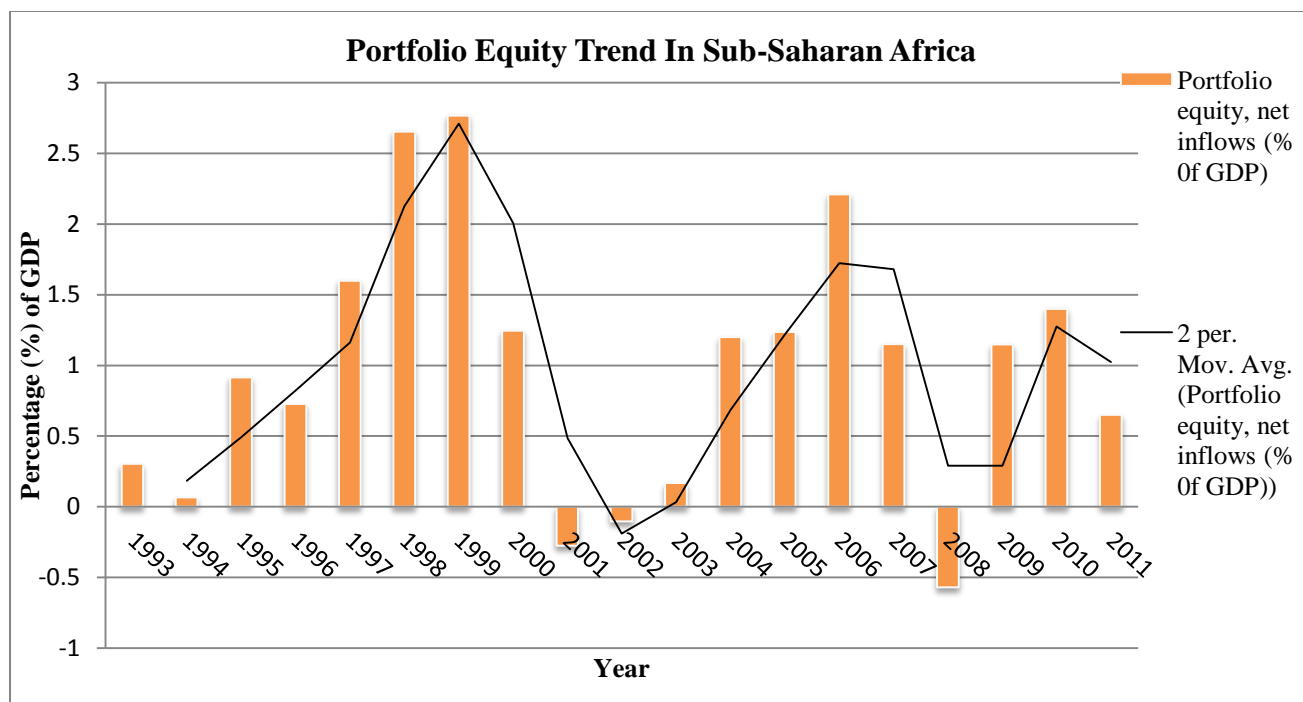


Source: World Development Indicators Database, World Bank.

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 later 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).

Figure 2: Sub-Saharan Africa: Trends in Portfolio Equity Flows



Source: World Development Indicators Database, World Bank.

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.

3. Literature 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.

Positive Relationship between 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.

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 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. The study 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. The study uses 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.

Negative/weak Relationship between 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. The study observes 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. Similarly, 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, the study 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 study by Edwards (2001), which inquires into the effects of capital mobility on economic growth using a cross-country data of 61 countries from 1981-1990, reports that a positive relationship between capital account openness will be evident after the attainment of a certain level of development. The study 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. Constructing a variety of measures of IFI, the study concludes 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 Recent Research on Financial Integration

Economic Growth Study	No. of Countries	Years Covered	Effect on Growth
Edwards (2001)	62	1980s	No effect for poor countries
O'Donnell (2001)	94	1971–94	No effect or, at best, mixed
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.

Literature implying mixed or weak relationship between IFI and 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. They make use of 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, 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 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 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 new 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.

3. The Empirical Framework and Model Specification

The econometric estimation technique employed in the 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 by controlling for endogeneity of the weakly exogenous variables that may arise from potential simultaneity or reverse causality in the model; and also controlling for country-fixed effects which is often captured in the error term of some estimation methods

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:

$$y_{it} = \gamma y_{it-1} + \alpha IFI_{it} + \beta' X_{it} + \eta_i + \varepsilon_{it} \dots\dots (7)$$

Where y_{it} is the logarithm of real per capita GDP growth, 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 (7) to obtain:

$$y_{i,t} - y_{i,t-1} = \gamma(y_{i,t-1} - y_{i,t-2}) + \alpha(IFI_{i,t} - IFI_{i,t-1}) + \beta'(X_{i,t} - X_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \dots\dots (8)$$

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:

$$y_{it} = \mu + X'_{it}\beta + \eta_i + \varepsilon_{it} \dots\dots\dots (9)$$

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:

$$y_{it} - \bar{y}_i = [X_{it} - \bar{X}_i]' \beta + [\varepsilon_{it} - \bar{\varepsilon}_i]. \dots\dots\dots (10)$$

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.

Data Description

Panel data of nine (9) variables for a maximum of 14 Sub-Saharan African countries over the period 1996-2010 were 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. We follow literature on growth regressions 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. We drop initial income and include trade openness in the control variables in order to avoid the issue of serial correlation.

Table#:

Variable Name	Measurement/Description	
<i>Initial Income</i>	logarithm of real per capita GDP (constant, 2000 US\$). We expect countries with lower initial income to experience higher growth than their counterparts with relatively higher initial income.	-
<i>Initial Schooling (EDU)</i>	Logarithm of the total public spending on education (% of GDP) in the initial year of the period under consideration. High public spending on education is expected to provide adequate infrastructure, study aids and all other requirements to facilitate education.	+
<i>Financial Development (FD)</i>	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	+
<i>Inflation (INF)</i>	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.	-
<i>Trade Openness</i>	as the sum of a country's total exports and total imports as a ratio of its gross domestic product (GDP).	+

Estimation Results and Discussions

Data Summary

Summary statistics of the panel dataset averaged over a non-overlapping 3-year period from 1996-2010 is presented in Table 1 below.

Table 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

Unit-root test results

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 2 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 3. 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.

Table 2: 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 3: 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.

To empirically investigate the relationship between Financial Integration and economic growth, we carry-out two empirical estimations; the system GMM dynamic panel estimation model and the GLS Random- Effects (EGLS) estimator.

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 4: 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.

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 4 above. The autocorrelation test is conducted on the null hypothesis that there is no autocorrelation in the data set. More importantly, we carry out a 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 4 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.

From Table 4, 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.

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 below. 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.

Table 5: 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, the results of both the EGLS and the pooled-OLS suggest that 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.

Further, the results support 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.

Synthesis of the Results

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 interpret the results of this study as not strongly accepting a positive relationship between financial integration and economic growth in SSA. At best, the data set suggests there is a mixed relationship between financial integration and economic growth in Sub-Saharan Africa.

Concluding Remarks

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 by suggesting 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. 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 plausible 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.

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.

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