FINANCIAL MARKET DEVELOPMENT AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICA: A DYNAMIC PANEL GMM APPROACH

ANUYA, DAVID E. & IFIONU, EBERE P.
Department of Finance & Banking, Faculty of Management Sciences, University of Port Harcourt, Rivers State, Nigeria

Abstract

*T*his study investigates the effect of financial markets development on economic growth in Sub-Saharan Africa using the dynamic panel GMM approach. Financial markets development is measured by three dimensions: access, depth and efficiency, while economic growth is measured by real per capita income. The data used were collected at yearly interval and have a panel structure, comprising all 48 countries in the Sub-Saharan African region over the period from 2000 to 2017. The empirical analysis is based on the Arellano-Bond first difference approach using lagged levels of the endogenous variables to control the endogeneity problem associated with dynamic panel models. We find that all the three dimensions of financial market development have a highly significant impact on economic growth. However, while both financial markets access and efficiency have negative coefficients, the impact of financial markets depth is positive. These findings have policy implications for Sub-Saharan countries regarding economic growth and developments.

97

EDITOR-IN-CHIEF
Prof. Ravinder Rena [South Africa]

INTRODUCTION

A developed and well-functioning financial sector facilitates the mobilization of savings, allocation of resources, exchange of goods and services, helps diversifying risks and avoids inequality. A developed financial system increases access to capital and subsequently enhances economic growth. Stiglitz (1998) opines that the financial sector is unique because of the risk and uncertainty both savers and investors face. Savers are often unable to select the investment projects that best matches their personal risk appetite and without pooling their money, savers cannot take advantage of increasing returns to scale in investments (Stiglitz, 1998).Furthermore, individual entrepreneurs or investors commonly lack sufficient capital to fund their investment projects on their own. Neoclassical growth theories tell us that an increase in the efficient investment of savings in new and innovative projects is one of the main engines of economic growth.

One important component of the financial sector used to measure the degree of the financial and economic development is the financial markets. The financial market comprises the stock markets (where equities are traded); foreign exchange markets (market for foreign trading of currencies); bond market (where both government and corporate bonds are traded); and derivate markets (where assets whose value are derived from their underlying assets). Literature shows that as economies develop, they increase their demand for the services provided by financial markets compare to those provided by banks. The stock markets provide liquidity as an important source of funds to companies and investors on capital accumulation that impact positively on economic growth. To promote investment opportunities and economic growth, stock markets encourage long-term growth by mobilizing savings, promoting specialization, and acquiring and disseminating information.

A capital market is a market in which individuals and organized institutions trade on financial securities in order to raise funds. The capital market is composed of both the primary and secondary markets. The primary market is a market for issues of new securities. Companies, governments, and other

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groups obtain financing through debt or equity-based securities. These markets are also known as "new issue markets," The primary markets are market where investors have their first chance to participate in a new security issuance. The issuing company or group receives cash proceeds from the sale, which is then used to fund operations or expand the business (Allen & Gale, 2001). The secondary market is market where old existing securities are traded by organized institutions. Stock markets allow investors to buy and sell shares in publicly traded companies. They are one of the most vital areas of a market economy as they provide companies with access to capital and investors with a slice of ownership in the company and the potential of gains based on the company's future performance (Vazakidis & Adamopoulos, 2009). Another segment of the financial market is the money market where financial instruments with high liquidity and very short maturities (under one year) are traded. It is market that used by participants as a means for borrowing and lending in the short-term notice. Money market securities consist of negotiable certificates of deposit (CDs), banker's acceptances treasury bills, treasury certificates, commercial papers, municipal notes, euro dollars, federal funds and repurchase agreements.

The foreign (forex) market is where different country currencies are traded. The market is the largest market in the world in terms of the total cash value traded, and any person, firm or country may participate in this market. Usually trading in this market takes place over the counter. Relative values of currencies are also determined through this market. Thus, this market enables the traders to exchange certain currencies for another currency (Brealey & Kaplanis, 1996). Bond markets are places where investors borrow money to government or some company in return for a pre-settled interest rate. There are two types of bond markets: the primary bond market and secondary bond market. The primary markets are markets in which bonds are traded for the first time after their issuance, whereas in secondary markets the preceding transactions of bonds are carried out (Wood, 1993). The derivative markets are markets where assets whose value are derived from their underlying assets are traded. A derivative is a

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contract whose contract price of the asset is determined by the market price of the asset.The derivatives markets are important part of the financial market because they can significantly improve risk diversification and management

Although, the positive link between financial markets development and economic growth is well-established in the theoretical literature,there are, however, mixed empirical findings regarding the extent of the impact of financial markets on growth.While some studies found evidence that is consistent with this theoretical prediction, others found that financial markets play an insignificant role in the economic growth process. Therefore, the theoretical view that financial markets development is an important explanatory factor for economic growth has not been fully validated empirically.

This study therefore contributes to the literature by employing the dynamic panel GMM framework to reconsider the impact of financial markets development on economic growth using a comprehensive panel data on Sub-Saharan African countries obtained from IMF and World Development Indicators Data bases. In particular, the study examines the relative impacts of the three dimensions of financial markets development: access, depth and efficiency, on per capita income focusing on all 48 Sub-Saharan African countries from 2010 to 2017. The study is distinct in that it incorporates these three dimensions of financial markets development as explanatory factors in a dynamic growth model, which (to our knowledge) is novel in the African literature.

The rest of this paper is structured into four sections. In section 2, we present the literature review on financing decisions and the market value of firms in Nigeria. Section 3 is data issues and methodology. Sections 4 and 5 contain empirical analysis and conclusions respectively.

Literature Review
Theoretical Framework
In this study, we argue that a well-functioning financial market is an important ingredient for economic growth. Hence, our theoretical

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framework is consistent with market-based theory which is a variant of supply leading theory.

The market-based theory explains merits of well-functioning markets through fostering growth and profit incentives, corporate governance, diversification and risk management (Levine, 2005). Unlike the bank-based view, the market-based theory emphasizes the importance of financial markets in driving economic growth. The role of the financial sector in increasing the amount of savings by creating sufficient incentives was emphasized by McKinnon (1973) and Shaw (1973). In order to reach higher savings and investment rates, they recommended for the creation of a "complete" financial market, that will: (i) liberalization policies so that regulatory obstacles do not prevent prices from adjusting to asset risks and returns; (ii) supervision of the sector (to safeguard individual investors), and (iii) macroeconomic policies focused on monetary stability to keep risk levels low.

Empirical Review

Ndebbio (2004) examined the relationship between financial deepening and economic growth and development using selected sub-Saharan African countries for only one decade using the ordinary least regression (OLS) process (from 1980-1989). He used M2/GDP and per capita real money balance growth rate (PCRMB) to reflect economic deepening and other control variables influencing economic growth, such as inflation rate, human capital and labor growth rate, as explanatory variables as opposed to real per capita GDP, the dependent variable. His regression results showed that financial deepening does positively affect per capita growth of output in these selected SSA countries, even though his parameter estimate of the variable of financial deepening was insignificant in one of his equations and he attributed this to shallow finance and the absence of well-functioning capital market in most SSA countries.

In seven of the Sub-Saharan African countries, Enisan and Olufisayo (2009) analyze the long-run relationship between stock market development and economic growth through autoregressive distributed lag (ARDL). The

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findings show that the stock market has a beneficial and important effect on growth. Causality findings suggest unidirectional causality for both South Africa and Egypt, from stock market development to economic growth. Although bidirectional causality is indicated by Cote D'Ivoire, Kenya, Morocco and Zimbabwe, Nigeria, on the other hand, demonstrates poor evidence that finance is caused by development.

Andrianaivo and Kpodar (2011) consider the impact of ICTon economic growth for African countries from 1988 to 2007. They employed the system GMM framework which addresses the problem of endogeneity associated with dynamic panel specifications. They find amongst others that ICT development enhances the effect of financial inclusion on economic growth.

Sunde (2012) explores the link between the development of the financial sector and economic growth in South Africa. In their report on financial development and economic growth, the study uses the neoclassical growth model used by King and Levine (1993) on cross-sectional data for 77 countries and Kilimani (2009). Using real GDP, large money as a percentage of GDP, inflation rate, real interest rate, trade openings, political uncertainty dummy, population and total credit as a percentage of GDP as variables and cointegration, model of error correction and Granger causality for the period 1977 to 2009 to test the path of causality, The results of the study show that economic growth is explained by variables in the financial sector and control variables in South Africa, such as inflation, exchange rates and real interest rates. The findings of the Granger causality test show that there is typically a bidirectional relationship between economic growth and growth in the financial sector, which means that the financial services sector often expands if the economy grows and vice versa.

Saqib (2013) uses cross-country data for the period 2005-2009 to examine the effect of the development and efficiency of the financial sector on the economic growth of a group of selected developing countries. Investment to GDP ratio, registration, M2 to GDP ratio, private loan to GDP ratio, spread (loan rate minus deposit rate), trade transparency, inflation, FDI to GDP ratio, real GDP growth and real per capita revenue growth are the variables

102

EDITOR-IN-CHIEF
Prof. Ravinder Rena [South Africa]

used. Using the Autoregressive Distribution Lag (ARDL) methodology, the results show that the effect of the efficiency of the financial sector on economic growth in developing countries is significantly positive. The influence of the growth of the financial sector and the performance of the financial sector is positive and highly important for a sample of 50 developing countries. The sensitivity analysis also shows that no matter what combination of the excluded variables in the basic model is used, the relationship remains positive and important. The results thus support the central concept that economic growth is driven by production and productivity in the financial sector.

The effect of financial development on economic growth was studied by Rashti, Araghi, and Shayeste (2014). Variables used as financial growth metrics consist of the ratio of credits to GDP of the banking system, the ratio of credits to GDP of services rendered by the banking system to the private sector, and the ratio of credits to GDP of the stock exchange and GDP of the effective economy, such as the investment-to-GDP ratio and economic transparency, as well as the dummy variable of the financial crisis of 2008. Three types of countries have been analyzed according to the World Bank classification: developing countries belonging to the OECD, high average income countries and low average income countries. The results of the models calculated using generalized timing methods indicate that the financial crisis had the largest impact on developing countries with high average incomes and had the least impact on developed countries and developing countries with low and medium average incomes. In addition, the financial development indices considered in the banking sector have had a negative impact on all the countries believed, but the capital market has had a positive impact on economic growth in the 1990-2010 period in countries with low average income and a negative impact on developed and high average income countries.

Alimi (2015) empirically examines financial deepening and economic development in 7 Sub-Saharan African countries: the implementation of the GMM panel data estimator method from 1981 to 2013. In order to examine the relationship between financial development and economic growth in

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Nigeria, South Africa, Lesotho, Malawi, Sierra Leone, Botswana and Kenya, the analysis employed both a static and dynamic panel data approach. Using real GDP as a dependent variable and domestic credit to the private sector as a proxy for financial development, the study found that financial development in the selected countries' panel did not lead to economic growth, thus providing support for the independent hypothesis that financial development and economic growth are, in essence, independent. The study also stated that, using two macroeconomic control variables: the real interest rate and the foreign direct investment proxied by the ratio of foreign direct investment inflows to GDP in order to prevent simultaneous regression bias, only the interest rate had a positive impact on economic growth, based on the two growth determinants considered in the estimated model.

Ehigiamusoe, Lean and Badeeb (2017) analyses the financial-growth nexus in Cote D'Ivoire and Nigeria using various proxies such as private sector domestic credit, large money supply and total bank credit, all to calculate financial development's GDP ratio to assess if the financial-growth nexus is responsive to proxies for financial development. In order to investigate the co-integration relationship between financial development and economic growth in Cote D'Ivoire and Nigeria for the period 1980-2014, this research uses the Autoregressive Distributed Lagged (ARDL)-Bounds test method. The results indicate that there is a relationship of co-integration between financial development and economic growth in both countries. Although the supply-leading hypothesis is accepted in Cote D'Ivoire, Nigeria supports the feedback hypothesis. The financial-growth nexus is responsive to the proxies used to calculate financial progress, further evidence suggests. The consequence of this research is that economic growth is encouraged through financial progress.

Muazu and Alagidede (2018) analyze the nonlinearities of the economic growth nexus in financial development based on the use of cross-country panel data for 29 sub-Saharan African countries during the period 1980-2014. The report uses annual data sourced from the World Bank's World Development Indicators (WDI). Two financial development initiatives were

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used in the study: private and domestic loans, real GDP per capita based on US$ 2005 constant prices to boost economic growth, inflation, investment rates, government spending, labor and trade openness. The inflation variable is the annual percentage change in the index of consumer prices used to provide stability in macroeconomic terms. The results of the Generalized Moment Method (GMM) framework show that while economic growth is supported by financial development, the degree to which finance helps growth is crucially dependent on the simultaneous growth of the real and financial sectors. Under balanced sectoral growth, the elasticity of growth to shifts in either the scale of the real sector or the financial sector is higher. They also show that rapid and unbridled credit growth is costing economic growth tremendously, with implications stemming from the funding of risky and unsustainable investments, combined with excessive inflation-fueling consumption. However, the passage through the investment channel through the excess finance-economic growth impact is greater.

Alakbarov and Murshudova (2020) examine the causal relationship between financial markets and economic growth in Georgia using annual data from 1995 to 2017. The results from frequency domain causality test show that financial markets development and economic growth are not causally related.

Recently, Vo, Van Nguyen, Nguyen, Vo and Nguyen (2020) investigate the dynamic relationships between derivative markets, economic growth and macroeconomic variables using panel data at quarterly frequency on 17 countries (both developing and emerging markets) up to 2017. The empirical analysis is based on panel vector autoregression, impulse-response functions and variance decomposition. They find a feedback causal interaction between derivatives markets and economic growth. They also find that the derivatives markets are more integrated with economic growth and macroeconomic variables in high-income countries than in upper-middle-income countries.

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Research Methodology

Data Description

In this study, we used panel data consisting of all 48 countries in the Sub-Saharan African region for 18 years from 2000 to 2017. The variables are per capita income (PCI) and three dimensions of financial markets development: Financial Markets Access Index (FMAI), Financial Markets Depth Index (FMDI) and Financial Markets Efficiency Index (FMEI). While per capita income data were obtained from the World Development Indicators Database, all financial markets development data were sourced from the IMF database. Our analysis is done in both EXCEL (descriptive) and EViews (empirical).

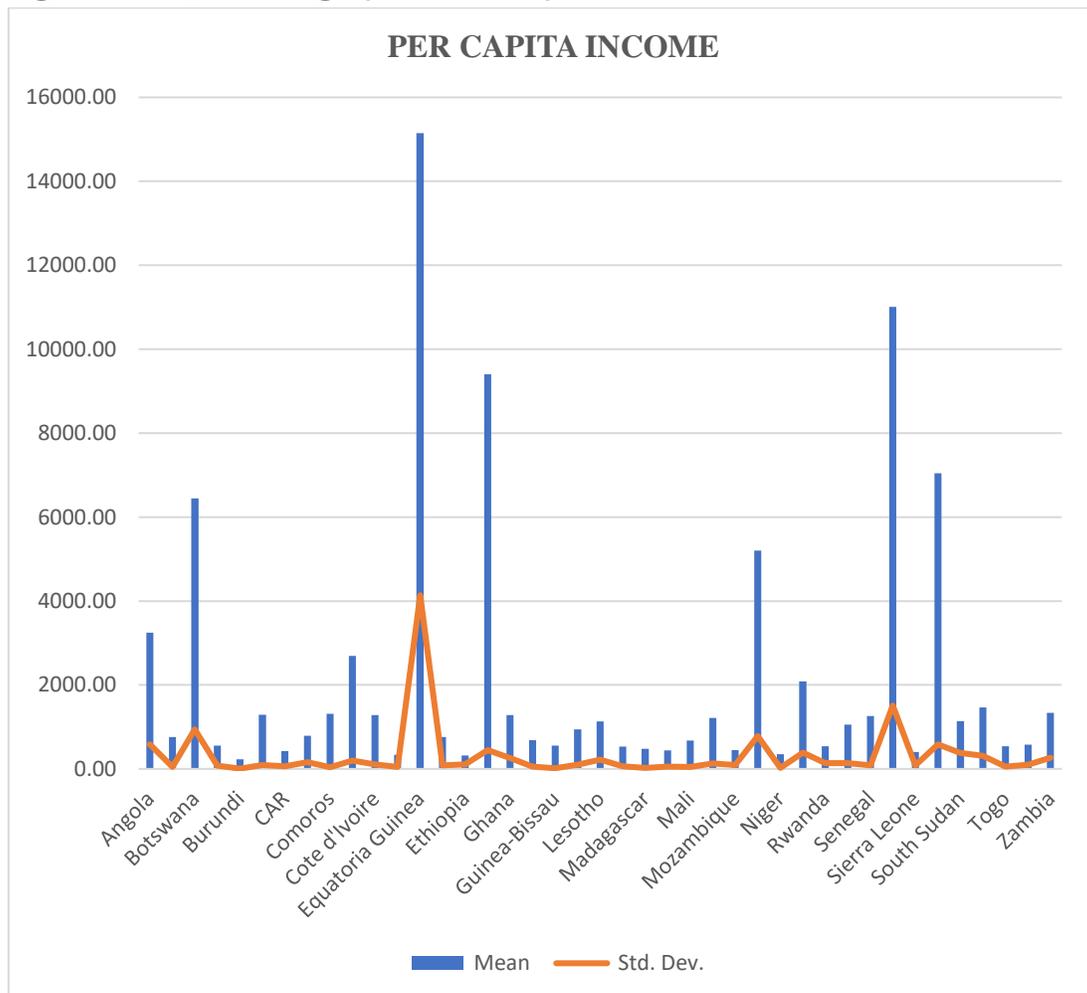Figures 1 to 4 show a graphical description of the data.

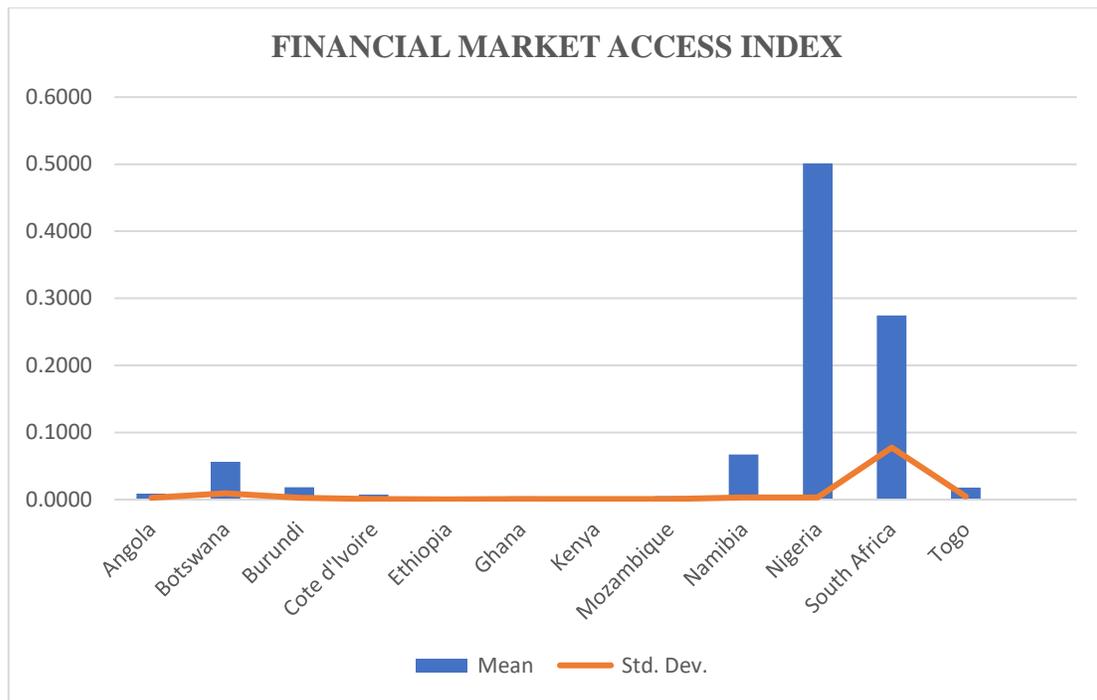**Figure 1: Mean and Standard Deviation for Per Capita Income**

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Figure 2: Mean and Standard Deviation for FMAI
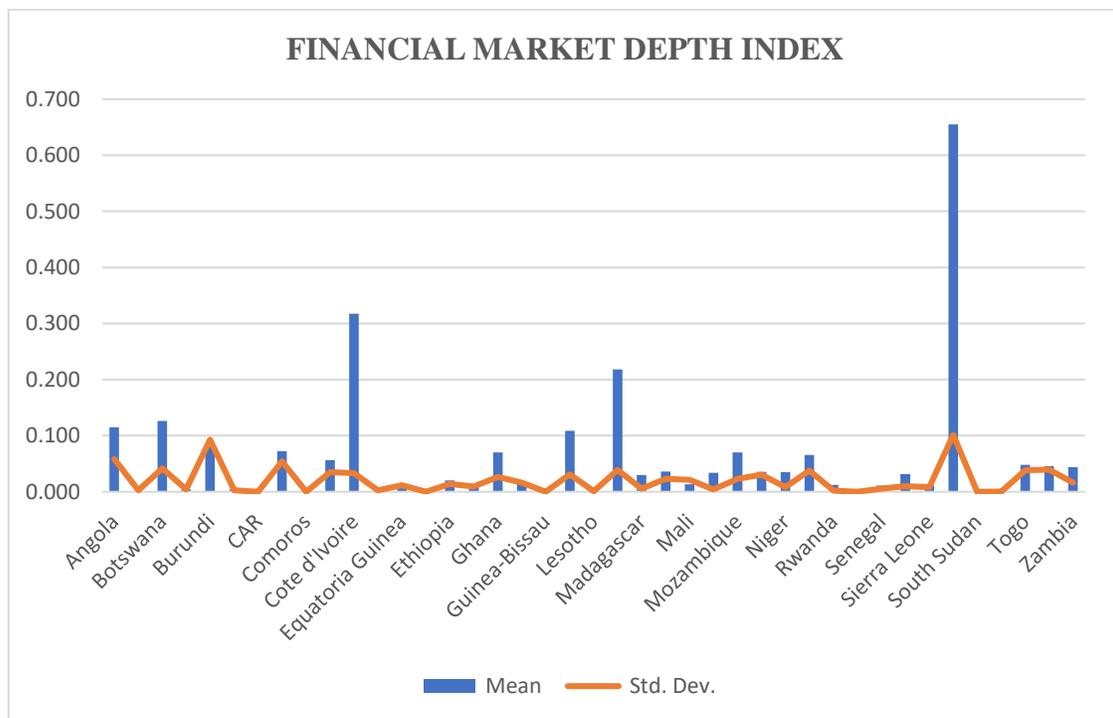
Figure 3: Mean and Standard Deviation for FMDI

107

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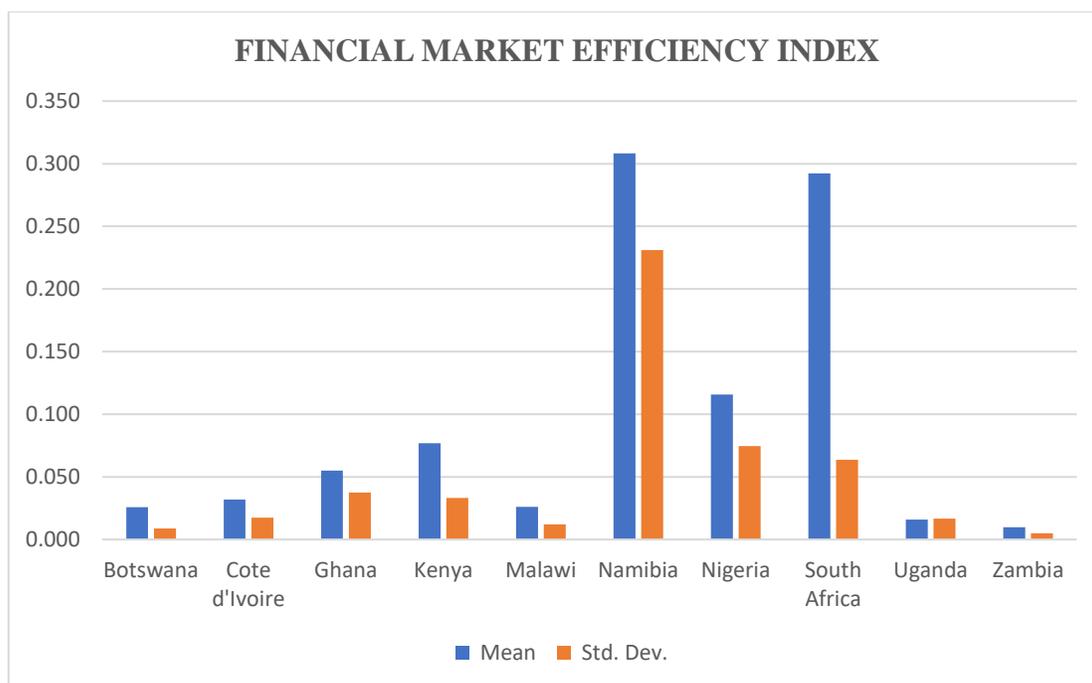**Prof. Ravinder Rena [South Africa]**

Figure 4: Mean and Standard Deviation for FMEI

Model Specification

To examine the effect of financial markets development on per capita income, we employed the dynamic panel GMM based on the first difference Arellano and Bond (1991) approach. This framework, which is based on instrumental variables, is particularly used because of the large body of evidence suggesting that it is suitable for controlling the possible endogeneity bias arising from the possibility that the causal link from financial institutions development and economic development can be reversed.

Consistent with the main study objective, we specify the Arellano and Bond's (1991) first difference dynamic Panel GMM model linking per capita income to the three financial markets development proxies; $FMAI, FMDI$ and, $FMEI$ as follows:

The econometric model for the relationship between dimensions of financial development and per capita income is given as follows:

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Prof. Ravinder Rena [South Africa]

$$\Delta PCI_{it} = \alpha_0 + \alpha_1 \Delta PCI_{it-1} + \alpha_2 \Delta FMAI_{it} + \alpha_3 \Delta FMDI_{it} + \alpha_4 \Delta FMEI_{it} + v_{it}$$
(1)

Where:

PCI = Per capita Income

FMAI = Financial Markets Access Index

FMDI = Financial Markets Depth Index

FMEI = Financial Markets Efficiency Index

where Δ is the first difference operator, α_0 is the regression intercept, and v_{it} is the error term. Also, α_1 captures the effect of past innovation in per capita income. The slope parameters, α_2, α_3 and α_4, capture the effects on per capita income on financial institutions access, financial institutions depth and financial institutions efficiency. The subscript i represents the cross-sectional dimension of the panel data while the subscript t represents the time index.

Empirical Analysis and Discussion

Empirical Analysis

Our specified economic growth (per capita income) model is estimated within the dynamic panel GMM framework using the Arelleno-Bond first difference approach. To control for endogeneity problem often associated with this estimation approach, we follow the usual way by using the lags of the dependent variable from period 2 to 3 as instrumental variables. Tables 1 and 2 shows the panel estimation results and diagnostic tests for the specified model.

Table 1: Dynamic Panel GMM Results

Variable	Coefficient	p-value
LPCI(-1)(α_1)	0.9208	0.0000
FMAI (α_2)	-1.0580	0.0000
FMDI(α_3)	0.2237	0.0000
FMEI (α_4)	-0.2876	0.0000
$Wald$ ($\alpha_2 = \alpha_3 = \alpha_4 = 0$)	335.95	0.0000

Source: EViews output

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Table 2: Model Diagnostic Tests

Statistic	Value
Instrument rank	41
J-statistic	38.446
Prob(J-statistic)	0.4038
AR(1)	-2.8535 (0.0043)
AR(2)	-1.2542 (0.2098)

Source: EViews output

From Table 1, we can see that α_1, which is the autoregressive coefficient, is estimated at 0.9208 with a p-value of 0.0000, indicating that lagged per capita income has a positive and highly significant effect on current per capita income. This shows that, *ceteris paribus,* an increase in per capita income in the current period would lead to an increase in per capita income in the next period. Hence, for Sub-Sharan countries,per capita income is persistent.

Further, FMAI ($\alpha_2 = -1.0580$) and FMEI ($\alpha_4 = -0.2876$) both are associated with negative coefficients, indicating that per capita income moves in opposite direction with both financial market access and financial market efficiency in sub-Saharan Africa. Thus, holding other factors constant, an increase in both financial market access and financial market efficiency would lead to a decrease in per capita income. On the contrary, FMDI($\alpha_3 = 0.2237$) is associated with a positive coefficient, indicating that per capital income moves in the same direction with financial market depth in sub-Saharan Africa. Holding other factors constant, an increase in financial market depth would lead to an increase in per capita income. However, FMAI (p-value = 0.0000), FMDI (p-value = 0.0000) and FMEI (p-value = 0.0000) all are associated with a zero probability, indicating that their effects on LPCI are highly statistically significant. The Wald statistic (p-value = 0.0000) is also associated with a zero probability, indicating that the

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combined effect of FMAI, FMDI and FMEI on LPCI is highly statistically significant.

From Table 2, the instrument rank is 41, which is greater than the number of the model coefficients, suggesting that our GMM model is overidentified. However, the J-statistic, which tests the validity of the included instruments, has a p-value of 0.4038, indicating that the Sargan test is statistically insignificant. Thus, at all usual significant levels, there is no evidence to reject the null hypothesis of valid overidentifying restrictions, implying that our fitted GMM model for per capita income is well specified. Further, the first order Arellano-Bond statistic (AR(-1) = -2.8535, p-value = 0.0043) has the expected negative sign and is highly statistically, whereas the second order statistic (AR(-2) = -1.2542, p-value = 0.2098) is statistically insignificant. Therefore, we conclude that the model error terms have no serial correlation in levels, which further validates our GMM results.

Discussion of Findings

Financial Institutions Access and Per Capita Income

As revealed from the finding of this study financial market access indicate negative and highly significant association with per capita income in the study SSA countries within the period under review. The negative coefficient of -0.2876 on FMAI (α_2) indicates that per capita income moves in opposite direction with financial market access in the study SSA countries. Thus, holding other factors constant, an increase in financial market access would lead to a decrease in per capita income.

Generally, economic theory suggests that access to savings, credits and payments has a significant effect on reduction of poverty, income inequality and economic growth. Having access to credit by individuals as well as firms willsmooth consumption during difficult times, allows households and firms to undertake riskier investments, increase the productivity returns to investment, reduce income inequality and poverty and thus facilitate economic growth. The removal of financial market friction is therefore essential to reduction in poverty, income inequality and a gateway to sustainable economic development. According to the World Bank

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Development indicators (World Bank 2006; 2008), countries with higher levels of financial inclusion (access to savings, payments and credits) had lower poverty levels. However, the result from the hypothesis tested on the relationship between financial market access and per capita income indicates negative and significant association in the study SSA countries. This could be attributed to challenges of underdeveloped financial system and low access to financial services in the region. As shown in appendix 1 & 3 of 2013 country ranking, the region lags behind all world regions, in financial development and financial market access dimension. Empirically, the result agrees with findings of Andrianaivo and Kpodar (2011) who found evidence that, in Africa, large share of the population are financially excluded and therefore resort to the use of informal financial services constrained by lack of access to financial services and absence of depth of financial instruments. However, it shows that with financial infrastructure expansion the region can be mobilized to improve the conditions of poor countries within the region.

Financial Markets Depth and Per Capita Income

Financial market depth is often determined by the volume of the activities engage in by the financial markets in relation to the size of that economy's activities. A well-developed financial system according to Levine (1993) can as well be described as deep when it provides the economy with sufficient credit and other financial services relative to the size of the economy activities. Theories hold that the more liquid money is available in an economy, the more opportunities exist for continued growth, as it increases the ability of firms and individuals to access the basic services like education and health, having direct impact on poverty reduction. In contrast, financial shallowness limits monetary, fiscal and exchange rate policy choices, impedes opportunities for hedging and diversification of risk hence retards economic development (Goldsmith,1969).Thestudy result revealed that financial market depth is positive and highly significant relationship with per capita income in sub-Saharan African countries within the period under review. The positive coefficient of 0.2237 on FMDI (α_3) indicates that per

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capital income moves in the same direction with financial market depth in sub-Saharan Africa. Holding other factors constant, an increase in financial market depth would lead to an increase in per capita income. Empirically, the result agrees with that of Ndebbio (2004) and Enisan and Olufisayo (2009) on this subject.The result could be due to the global economic meltdown witnessed with period of this study. Within this period of economic meltdown there have been significant pressure from most developed nations and international financial institutions on short-term capital inflows to most Sub-Saharan African countries which attested the positive and highly significant effect on per capita income observed from the hypothesis tested in this regard within the period under review. However, the result is contrary with the finding of Alimi (2015).

Financial markets efficiency and per capita income

Efficiency, broadly speaking is how well the financial system performs finance functions. Financial marketsefficiency refers to the ability of financial markets to provide financial services at low cost (minimum cost) relative with sustainable revenues (desired total revenues).The study results revealed that financial market efficiency has a negative and highly significant relationship with per capita income in the study sub-Saharan African countries within the period under consideration. The result empirically conforms with Pantaleo (2008) who examine the link between financial sector efficiency and economic growth among three East African countries: Tanzania, Kenya and Uganda. However, this study financial market efficiency variable was stock market turnover ratio (stock market turnover /capitalization. The negative coefficient of -0.2876on FMEI (α_4) indicates that per capita income moves in opposite direction with financial market efficiency in the study sub-Saharan African countries. Thus, holding other factors constant, an increase in financial market efficiency would lead to a decrease in per capita income. This implies that if financing functions are performed well, the financial system will contribute positively to economic development and prosperity. On the other hand, if the functions are performed ineffectively, however, additional costs will be imposed on

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society, potentially undermining economic performance. Symptoms of inefficiency could include high transaction costs, limited or poor-quality financial services and products, a lack of responsiveness to customer needs, misallocation of resources and widespread corruption throughout the economy over time.Waheed and Younus (2010) stated that the financial sector's development is crucial to economic growth and the efficiency of the financial sector is potentially important to the long-term growth performance of the countries.

Conclusion

Consistent with supply leading finance-growth theory, there is evidence that financial markets development positively and significantly affects per capita income. Thus, improving financial markets in terms of access, depth and efficiency would lead to higher per capita income, a prerequisite for economic growth in Sub-Saharan Africa.

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