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FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN SELECTED AFRICAN COUNTRIES: PANEL DATA ANALYSIS

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Abstract

Healthy functioning of the financial system leads to higher contribution to country's massive economic growth and development however such theoretical presumptions if accompanied and supported by empirical finding, the result comes acceptable for consumption by various agencies and may be used for further investigations. This paper work is an attempt to investigate the nexus between financial development and economic growth in 10 selected African countries Nigeria, South Africa, Egypt, Algeria, Morocco, Kenya, Ethiopia, Ghana, Tunisia, and Mauritius through analysis of annual panel data for the period 1990-2018. Using secondary data the study employs the fixed effects (FE) and random effects (RE) model and confirms that there is positive relationship between financial development and economic growth for all countries. Thus, it is necessary to give prior attention to financial development in the selected region to promote sustainable economic growth for eradication of poverty.

Keywords: *Financial development, economic growth, panel data analysis, Selected African Countries.*

1. Introduction

There has always been a great deal of controversy over the significant contribution of the financial development in improving economic growth and achieving macroeconomic balance in Africa, a circumstantial assessment of financial development indicates that financial markets in Africa including financial deepening is much behind the standard average. Among different dimensions, poor financial system in the continent led to low economic growth which aggravated

poverty and force the people to live bellow standard of life for the largest proportion in the region. Moreover, performance of growth and development in the region differ from country to country. The factors that contributed to such variations in economic growth are not unique for all countries.

The economic development and growth have always been the centres of economic policy analysis. The endogenous growth theory has highlighted that the level of transformation of inputs resources into output depends upon the environment and how the input resources are mixed up. In recent past the economists are focused exploring the different types of environment which are conducive to economic growth. Financial system and its environment have attracted lot of attention of the economists for its importance in the development and economic growth. To contribute in a country's growth and economic development there is need for great degree of co-ordination between different sectors and their combination. It has been claimed that economic situations most significantly impacted by channels of the financial system. Particularly, under the influence of liberalization, integration of global economy and globalization, that made countries to be more concerned with the importance of finance in economic growth.

Financial system process comprises the coalition of various institutions and activities hence it enhances quality, quantity and financial system efficiency. Financial development occurs when financial measurements, intermediaries and financial system markets are developed and then impacted asymmetry of information, implementation and transaction costs (Levine, 2005). Thus, financial development embraces the controlling of investment projects, improving in resources allocation, saving mobilization, managing and diversifying risk. Financial development, besides facilitations in exchange of goods and services it stimulated by the improvement in regulatory of corporate governance after supplying financial support. Each of these roles is possibly to effect decisions on investment and saving, thus they influence economic growth.

The increment of specific measure of gross domestic product (GDP) or per-capita income of a country is referred to economic growth. A lot of economic literatures have been done in decades to exhibit the contribution of financial system to economic growth. Post experiences also provide ample support to this fact. In this connection Sen (1999) states that access and availability of finance is vital for economic agents to function securely in an economy. From micro credit tiny establishments to large enterprises the system is applicable. It is evidenced in the works of (king & Levine, 1993a; Mckinnon, 1973; Shaw, 1973) that financial institutions are significance to economic growth. They underlined that the different quality and quantity of services delivered by financial institutions led to an important reason for achieving various economic growth.

Recently, realizing the importance of financial system in economic development a lot of attention has been given to the researches of the nexus between financial system and economic growth by numerous scholars (Miller, 1998). Though, different results and views were presented on the contribution of finance in economic development. Levine (1997) indicated that

institutions of finance improve the effectiveness of economy which eventually leads to economic growth, by facilitating capital to opportunistic entrepreneurs; on the other hand Lucass (1998) put his opinion in the way that finance sector contribution to economic growth is too much emphasized. Nevertheless, the debate in current theoretical findings on the linkage between financial system and economic development relates the endogenous growth theory and financial system microeconomics (Eryılmaz, et. al., 2015).

The most African country economies are lacking development both financially and in real sector economy. Between late 1980s and late 1990s these countries liberalized their financial system, following the structural adjustment programs promoted by World Bank and IMF. The adjustment program focussed on interest rates liberalization, credit ceiling removal, privatization and reorganization government-owned banks, the introduction of different methods to encourage the improvement of financial markets and private financial system. Associated with the above methods, bank monitoring and supervisory plans together with the activation of deposit insurance in some countries were implemented (Cull et al. 2007). Therefore, because of the reform on financial sector, a more liberalized financial situation has appeared in the continent. These adjustments stirred by fast developments on world situations and technological connection among the African's and the rest of the world (IMF, 2013).

Therefore, the question arises whether these economies have efficient financial system so that greater reliance is placed on voluntary and market-based decision-making systems. Just like other underdeveloped economies, in the formal sector the allocation of financial resources mainly comes through banking system, so it demands the study of financial development and its role in the growth of countries' economies.

2. Review of Literature

In recent times, the financial system and economic development linkage has been empirically investigated for several regions, groups and nations over varying period of time. However, in association to financial system and economic growth, still no accordance has been reached on the causality and significance of the financial system towards economic growth. An extensive number of literatures associated to such linkage could be reviewed through dual major directions. One part of empirical study results based on panel and cross sectional data analysis that have focused on the relationship between financial system and economic development mostly reached at the conclusion that there is positive linkage among causalities. On the other way round, there are researches that have been done concerning financial system and economic growth at times they showed a by-directional linkage from financial system to economic growth and at times encountered a result from economic growth to financial development (vice versa).

The foremost arguments mainly emphasised on measures of financial system and relationship between economic development and finance with its determinants. These two most important

issues in the direction of relationship were discussed with four main schools of thoughts: the demand – following hypothesis (Shaw, 1973, Jung, 1986),supply – leading hypothesis (Levine Mackinnon, 1973;King & Levine, 1993a), two-way directional link (Greenwood & Jovanovic, 1990) or no linkage (Lucas, 1988). Various researchers arrived at different conclusions that led to difference of opinion. A few researchers underlined the importance of financial development to growth while other studies revealed opposite results. But Mckinnon, 1973 and Shaw, 1973 have immensely explained financial developments advantage to economic growth in their study.

Well-functioning of banks are capable of financing the productive and profitable projects Schumpeter (1992), While Gurly and Shaw (1955) emphasised the contribution of financial sector on the efficiency of investments so that the allocation of investment efficiently leading to the rise in capital income and hence creates the rise in capital accumulation and also the increase in savings. On the other hand, McKinnon (1973) specified liberalizing finance and maintaining big value interest rate prompts savings hence to increase the participation of entrepreneurial activities thus to have an impact on growth. Advantages like, controlling in the monetary policy of upper limit interest rate as it distributes the credit found to be missed. Importance of capital accumulation in finance sector had perceived by Greenwood and Jovanovich (1990). Moreover Levine (1997), pointed out that financial system mainly serve as a channel between ordinary households to opportunistic entrepreneurs by providing and minimizing Information asymmetry to reliable projects ex-ante, controlling and applying corporate monitoring ex-post, facilitating transaction and risk diversification.

Goldsmith (1969) arrived at the conclusion of developing finance through financial institutions contribute to economic development. One of the prominent findings in the 1990's was done by King and Levine (1993) and they argued that different dimensions of finance are positively related to economic development. Furthermore, it was concluded that the determined measures of financial system is a reliable indicator of economic growth for long-run. Also, the study reached at the conclusion of future enhancements in effectiveness and rates of investment of capital strongly associated with greater level of financial development. It was incorporated that financial system not only predicts long-run economic development but also follows growth.

Additionally, both Shaw (1973) and McKinnon (1973) argued that fall back economies encounter suppressive financial policies which had vulnerable to their economic improvement. Because of the paybacks and benefits to be gained from financial repression policies, many of the countries engaged to implement and pursue repression of financial policies and the benefits could drive country rulers to follow financial system repressive policies. Furthermore, repression financial measures can be applied to attract and achieve economical projects to specific sectors in the country's economy. Financial system repression had the impact of severely touching the quality and quantity of capital accumulation, and subsequently, economic growth and development, thus it is largely practiced in less-developed economies to increase their income

(Auerbach and Siddiki, 2004). In developing countries governments put forth as a strategy to generate more income by raising the money supply but that steered to greater inflation. The increase in inflation had the impact of lowering capital accumulation and investment and then affecting the country's economic growth, therefore directing to conclude that financial system repression has an adverse impact on economic growth (Ibid).

In addition, financial functions may affect economic development through technological innovation, accumulation of capital and investment efficiency. It is argued that capital accumulation drive growth which is accompanied by financial intermediaries. The efficiency instrument assumption expresses that financial system possibly raises the productivity of investment by regulating the finance to productive entrepreneurs. Financial institutions in the financial sector development minimizes asymmetry of information and select those productive entrepreneurs that successfully launch advanced production processes hence increase the rate of technological advancement. Financial development also helps in technical innovation as evidenced by pilhyun Kim (2006) that financial deployment is certainly important in boosting the growth rate of innovative product.

Besides, King and Levine (1993b) highlighted on capital accumulation significance of financial system and productivity of growth. They reached at the conclusion of important association among measures of financial system and capital accumulation, per-capita growth, and efficiency of growth. Whereas, other studies showed that the direction of causality is occurred not by the volume of investment rather it is by the efficiency of investment and it is from financial development to economic growth (Gregorio and Guidiotti, 1995).Moreover, research results that concentrated on the development of stock market indicated that there is direct linkage among institutions of banks and non-bank, stock market, pension funds and insurance companies (Demirguc, Kunt& Levine; 1996a, 1996b).

Additionally, it was investigated the relationship among various channels of financial system development and economic growth by Bakhouche, 2007 for the North African country Algeria. The empirical model they used was the "supply leading" hypothesis. Moreover Long-Run and short-run Granger causality tests were used on the bounds test, applied to an autoregressive distributed lag (ARDL) model and these tests provide no empirical support for any direct association among the Algerian financial system and economic development. The study concluded that the financial system did not appear to perform an effective role in channelling savings into productive investment projects, and it cannot be considered as a leading contributor to economic growth in Algeria.

Further Levine & Zervos; (1996) concluded that there is direct and strong linkage between determined measures of long-run economic growth and stock market. Also; a significant association between economic growth and stock markets were obtained by Levine & Zervos (1998). Their finding shows that development of banks and stock market liquidity are directly

and considerably linked with, productivity increment, capital accumulation and economic growth. Glodsmith (1969), started Cross-country linked studies which aimed at to exhibit the linkage among finance and economic development and the result he obtained revealed that there was a robust direct linkage among the Per capita GNP rate and wealth of financial intermediaries (Kar et al., 2011). Further studies done by Hassan et al., (2011) on the association between financial system and economic development resulted positive relationship. From his analysis of the determined panel data for developing countries, the regression results depicted that there is direct linkage among financial system and economic development.

Ahmed & Wahid, (2011) examined the relationship among bank based vs. market-based financial structures and grow thin African economies by applying the dynamic time series modelling technique and panel data co-integration analysis for the period of 1986-2007.They concluded that financial market development is significant for justifying and ensuring economic growth through increasing productivity and efficiency. Also, the empirical result depicted that banking system improvement are directly related to growth in capital accumulation and direct to fast rate growth. Besides this, financial liberalization aspects were also empirically examined. In this approach, Ahmed, (2010) analysed the association between financial developments, growth and financial liberalization using the techniques of unit root tests and co-integration analysis on dynamic panel data series over the period of 1976-2005.He involved up to 15 sub-Saharan African countries with annual observation and indicated that, there is a stable linkage between financial system and economic development. In his paper however, there was negligible indication to substantiate the premise that financial liberalization positively resulted economic growth. Moreover, Saci et al. (2009) concluded that development of stock market measures have direct role to impact growth. Leitao (2010) confirmed that there is a direct relationship of finance and economic growth for five BRICS countries and 27 European Union Countries. Again, Adusei (2013) got the same result and indicated that there is a direct association between finance and economic growth for 24 selected African countries.

3. Methodology

The primary focus of present paper is to empirically investigate the linkage between financial development and economic growth in selected African countries. To fulfil the primary objective, study relies on panel data of African countries, accounting for almost three-fifths of the regional output, during the period 1991-2018.Panel data analysis has advantage of capturing both- spatial as well as temporal behavior of any phenomenon.

3.1. Hypotheses

Hypothesis 1: Financial development contributes positively to the economic growth.

Hypothesis 2: Controlling variables such as capital formation and external sector performance are expected to spur the growth, whereas inflation can have negative effect on growth.

3.2. Model Specification

After intensive review of literature[1], present study arrives at following investment function to be estimated:

Growth = F (investment, financial development, external sector, economic stability)

The model captures the broader dimensions of economic growth such as productive capacities, financial development, external environment, and policy environment.

To fulfil the objective of the study, this analysis utilises a simple linear regression model expanded in the following functional model:

$$Growth_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 GFCF_{it} + \beta_3 REER_{it} + \beta_4 Inf_{it} + u_{it} \quad (1)$$

Where subscripts i and t denotes the observations with respect to country and time period, respectively. Growth is the log value of per-capita real GDP. FDI is the composite index of financial development based on major indicators related to financial institutions and financial markets. β_{0i} is the country-specific fixed effect and β_s captures the country-specific long-run coefficients of controlling variables. The μ_{it} is the error term.

3.3. Data Sources and Variables Selection

The study is relied on secondary data and most of variables are organized from World Bank data base, a publication of World Bank, World development indicators. Other data sources areInternational Monetary Fund (IMF) publications, African Development Bank publications, the national sources of the government prospective selected African countries publications, and Reserve Banks of these countries publications. Following the existing literature, economic growth is measured with log value of real per-capita gross domestic product (GDP). The financial development is measured through a composite index derived through the financial institutions and financial markets dimensions of the system. These two dimensions are measured through liquid liabilities as % of GDP, the deposit money bank assets as percentage of total assets central as well as deposit money banks, domestic credit to private sector as percentage of total domestic credit, domestic credit to private sector as percentage of GDP, Interest rate spread, lending rate minus deposit rate, in percentage and credit generated by banking sector to private sector as % of GDP. On the front of financial markets, we have stock traded value ratio, turnover ratio and market capitalization. The controlling variables are investment rate (GFCF as % of GDP), real effective exchange rate (REER) and inflation (INF). Different studies have utilized such type of controlling variables while empirically estimating the role of financial development on growth (Guru and Yadav 2019; Khalil, 2014).

[1]https://www.tandfonline.com/doi/full/10.1080/23322039.2018.1449780

3.4. Methods of Analysis

The study uses the panel data models to fulfill the above mentioned objectives: Keeping into account the availability of panel data, study employs the fixed effects (FE) and random effects (RE) model.

3.4.1. Fixed Effect Model

The specification of fixed effect model is as follows:

$$G_{it} = \beta_{1i} + \beta_2 X_{it} + \varepsilon_{it} \quad (2)$$

Where i and t subscript are for each individual and time, respectively. G is the dependent variable and X_is are explanatory variables. The model assumes constant slope coefficient (β_2) and the behavioural differences between individuals are incorporated in intercept of the model (β_1).

In fact, the fixed effect model has limitations that the model assumes slope coefficients constant across time and individual. Any individual heterogeneity either temporal or spatial or both) is assumed to be captured by the intercept. However, individual variation can be captured by different set of models while taking the dummies equivalent to the number of cross section units. But that model would suffer problem of imprecise estimation in case of amid limited data observations. Moreover, the likely chance of correlation between explanatory variables and error terms may exist amid variability in individuals' characteristics, and consequently the precision of estimators gets affected. In order to overcome this problem, random effects model which relies on orthogonal condition, meaning by no correlation between white noise and explanatory variables, is introduced.

3.4.2. Random effects model

The specification of random effect model is as follows:

$$G_{it} = \alpha_1 + \alpha_2 X_{2it} + \alpha_3 X_{3it} + (\varepsilon_{it} + u_i) \quad (3)$$

This model includes the components of a random individual effect (u_i) and a usual regression error term (e_{it}) (Hill et al., 2011).[2]

However the estimation using these models is full of controversy on the ground of under-estimation of the standard errors eventually producing false conclusion of hypothesis testing pertaining to model parameters. Literature argues that the classical linear regression models are suffered with problems of heteroscedasticity and autocorrelation nature of the disturbance (Victor et al., 2015). Herein, it is worth to utilize the linear panel models which accounts for the

[2]R. Carter Hill, William E. Griffiths & Guay C. Lim (2011).Principles of econometrics.Fourth Edition.John Wiley & Sons, Inc. USA.

problems of autocorrelation and heteroscedasticity. In order to overcome this problem, the generalized least square method is performed. However the above mentioned methods are suitable for capturing the static behaviour.

4. Empirical Results and Discussion

Study utilizes the static models to capture the importance of development of finance in economic growth in African countries. Herein, we have two models- random effects and fixed effects models. For the purpose of best model selection, the conventional Hausman test is applied, which compares the estimators obtained through fixed effects and random effects model. Acceptance of null hypothesis that there is no systematic difference in coefficients, suggests for fitting the random effects model and rejection of it supports the fixed effects model. The results of test statistic are presented in Table 1 where calculated test statistic is 6.12, thereby suggesting the failure to reject the null hypothesis. Accordingly, the random effects model is appropriate method for the given data set. It indicates that the estimates will be relatively consistent and efficient as RE model accounts the orthogonality condition.

Table 1: Hausman Test Statistic

Variable	(b) Fixed	(B) Random	(b-B) Difference	sqrt(diag(V_b-V_B))
REER	-0.041	-0.041	0.000	0.000
GFCF	0.617	0.616	0.000	0.000
FDI	0.081	0.081	0.000	0.000
INF	-0.219	-0.221	0.000	0.000
Hausman Test: $chi^2(5)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 6.12, P-value = 0.190				

Source: Authors' Computation

Having confirmed the diagnostic test, the results derived through the random effect model are presented in table 2.As per coefficient value, it is witnessed that the financial development (denoted with FDI in the study) has positive role in explaining growth of African countries. The controlling variables such as real effective exchange rate (REER) and inflation (INF) are found with negative coefficient value and statistically significant also. This finding of negative impact on growth coincides with the existing literature (Ndoricimpa, 2017 for African countries and Ahiabor and Amoah, 2019 for Ghana). The results are in line of theoretical arguments that the higher exchange rate makes the costlier access of capital goods and thereby limiting the productivity enhancement. Inflation above the threshold level can have the discouraging effect on the demands side and thereby limits the growth potentials. The productive capacity measured through the domestic capital formation (GFCF) is found to increase the economic growth for African countries. This finding is in line with Meyer & Sanusi, (2019) which reports the positive contribution of capital formation in economic growth of South Africa.

Table 2: Financial Development and Economic Growth: Random Effect Model

Dependent Variable Log of per-capita GDP

Variable	Coefficient	Std. Error	Z-value	P-value
REER	-0.041	0.000	-1.810	0.070
GFCF	0.616	0.001	4.970	0.000
FDI	0.081	0.000	3.530	0.000
INF	-0.221	0.001	-3.550	0.000
_cons	3.173	0.127	24.910	0.000
sigma_u	0.372			
sigma_e	0.093			
Rho	0.942	(fraction of variance)		
Modified Wald test for groupwise heteroskedasticity: chi^2 (10) = 6281.0, P-value = 0.0000				
Pesaran's test of cross sectional independence = 20.38, P-value = 0.0000				
Wooldridge test for autocorrelation in panel data: F(1, 9) = 93.51, P-value = 0.0000				

Source: Authors' Computation

As reported in numerous literatures, panel data set is prone to the problems of autocorrelation panel heteroskedasticity. The same is evidenced with the Wald test statistic, wherein null hypothesis of homoskedasticity is rejected (Table 2). Besides, the cross-sectional dependence has always remained a major issue while estimating the panels composed of longer periods (over 20-30 years). This dependence can lead to contemporaneous correlation and accordingly imprecise estimation. Herein, Pasaran CD test statistic confirms the presence of dependency across panels as the null hypothesis of no correlation of residuals is rejected (Table 2). Serial correlation problem mainly occurs to macro panels having longer time series of about 20-30 years. Presence of serial correlation renders the imprecise estimation amid smaller standard errors of the coefficients than the actual values. As reported in numerous literatures, panel data set has tendency of autocorrelation behaviour. In order to diagnose the same, study considers the Wooldridge test (2002)[3] where null hypothesis of no first order autocorrelation is investigated. The F- statistic value is much high and accordingly statistically significant, which confirms the autocorrelation pattern in the panel data (Table 2). In the presence of serial autocorrelation and heteroskedasticity, the panel estimation based on static models as suggested by RE and FE can render the imprecise estimation and requires the thorough analysis.

In the estimation of linear panel models, the GLS estimation produces the robust standard errors in the presence of cross-sectional correlation and heteroskedasticity across panels. GLS method

[3] Wooldridge, J. M. 2002. Econometric Analysis of Cross Section and Panel Data. Cambridge, MA: MIT Press.

has advantages of capturing the autocorrelation within panels, cross sectional correlation and heteroscadesticity across panels. Since the present results are not suffered with the autocorrelation problem, hence study addresses the later two problems using appropriate methods. The estimated results based on GLS method are presented in table 3.The empirical results confirm that financial development has direct effect on economic growth and statistically significant at 10 % level of significance. The coefficient value suggests that 1 % increase in the development index leads to 0.02 % increase in economic growth for sample African countries. The impact in terms of magnitude is smaller as it can be argued that financial development is in nascent stage and the same would require more development yet. This findings support the line of argument in the literature that the economic growth is explained by financial development along with controlling variables (Bist, 2018 for low income African countries).[4]Other controlling variable such as REER, domestic investment and inflation are found significant with expected sign (Table 3).

Table 3: Financial Development and Economic Growth: GLS Approach

Dependent Variable Log of per-capita GDP

GLS (IGLS)			GLS (panels, heteroskedastic)		
Variable	**Coefficient**	**P-value**	**Variable**	**Coefficient**	**P-value**
REER	-0.387	0.000	REER	-0.140	0.017
GFCF	0.242	0.487	GFCF	0.577	0.002
FDI	0.024	0.802	FDI	0.088	0.071
INF	-0.898	0.000	INF	-0.659	0.000
Cons	3.743	0.000	Cons	3.326	0.000
Wald $chi^2(4) = 42.11$, Prob > $chi^2 = 0.0000$			Wald $chi^2(4) = 73.36$, Prob > $chi^2 = 0.0001$		

Source: Authors' Computation

5. Conclusion

Financial development and economic growth relationship is becoming a big concern for researchers and different stakeholders recently. In this paper, for the period 1990 – 2018panel data analysis was used to examine the relationship between financial development and economic growth in 10 selected African countries. Based on the study findings, there is a positive association between financial development and economic growth. The results obtained are accordant with earlier findings that investigated the linkage between financial development and economic growth. Therefore our results confirmed that financial development and economic growth are associated positively while among controlling variables GFCF showed positive sign but exchange rate and inflation displayed negative coefficient values with economic growth. This

[4] Though, sample economies differ from our study.

study contributed an evidence for improving finance to economic growth in selected African countries. The indication of the results leads to the possible accomplishment of sustainable economic development through formulation and implementation of financial reforms and hence to benefit the relationship among finance and growth. Accordingly it is recommended that prior attention must be given to encourage the financial system in the countries real economy.

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