# Financial Innovation And Sustainable Development In Africa

## ELUMAH, Lucas Okah<sup>1</sup>, MURITALA, Adewale Taiwo<sup>2</sup>

<sup>1</sup>Department of Business Administration Nile University, Abuja, Nigeria Luvility@yahoo.com <sup>2</sup>Department of Business Administration Nile University, Abuja, Nigeria

#### Abstract

This research investigates how financial innovation impacts sustainable development in nine African countries between 2006 and 2020. The study used data from the World Bank Development Indicators and applied the GMM panel estimator to assess the relationship between financial innovation and sustainable development. The findings reveal that financial innovation can have both positive and negative effects on sustainable development, depending on the measures used to gauge financial development. When financial sector innovation is used as a measure, the study found a negative impact on sustainable development. However, when measuring innovation in the banking industry and capital market, the results show a positive effect on sustainable development. Therefore, the study recommends the implementation of policies that promote efficiency in the banking industry, the capital market, and financial innovation to ensure the effective operation of Africa's financial system. This paper contributes to the discussion of SDGs in Africa and further confirm the financial intermediation theory in Africa markets

Keywords: Financial Innovation, SDGs, Sustainable Development, Capital Market Development, Bank-Based Development.

## 1. Introduction

A wave of financial innovation begun in the early 1960s and has been sweeping throughout the developed countries and developing countries, hence, producing major changes in the financial landscape. Financial innovation has been an integral component of economic activity for several millennia. According to Levich, et al., (1988) the process of financial innovation differ from country to country, however, there are some common features among countries which include the development of new financial products and markets; a greater tendency toward market-determined interest rates and marketable financial instruments rather than bank loans; liberalization of domestic financial market practices through deregulation or a breaking down of conventions; globalization enabling financial markets grow more integrated; and increased competition among financial institutions, with many of the traditional distinctions between commercial banks, investment banks, and securities firms becoming blurred in the process.

Nielsen (2006) asserts that in today's dynamic markets, an organization's ability to continually develop its capabilities is the key to superior performance and is the foundation for the products and services offered by the firm. Therefore, companies in the financial sector are vigorously pursuing innovation to remain competitive, differentiate themselves from others, and introduce a variety of new products. According to Simon and Kwak (2012), the primary objective of financial innovation is to enable financial intermediation where it may not have been possible before. In contrast, Levich (1988) as cited in Muli et al., (2013), argued that transaction costs are a significant driver of financial innovation, as reducing these costs creates a profit opportunity for the firm.

According to Dimitrios and Mention (2013) and Ajide (2016), financial innovation is the key link between the financial sector and sustainable development. This involves changes in the products and services offered by banks, insurance companies, investment funds, and other financial service firms, as well as modifications to internal structures and processes, managerial practices, and new ways of interacting with customers and distribution channels (Mention & Torkkeli, 2012). Financial innovation is considered to be strategic and valuable only if it can ensure sustainability in the financial sector (Costanzo, et al., 2003).

The achievement of true global sustainability necessitates a significant restructuring and reorientation of the global financial system. According to UNCTAD, the Sustainable Development Goals (SDGs) will require an annual investment of \$3 to \$5 trillion in

developing countries alone. To meet these demands, a sound economic policy must be established with coherent financial regulation that enables both governments and private investors to make long-term investments (UNEP, 2015). However, financial intermediation in developing countries has been inadequate in meeting the needs of the population, particularly those in rural areas who depend on agriculture for their livelihood (Muhammed, 2014). As a result, financial innovation may be the solution to make financial services available to individuals at all income levels and support sustainable development.

UNEP (2015) contends that the increasing scale and sophistication of Africa's financial system alone will not achieve sustainable development as international evidence has shown that financial and capital markets can fail to adequately serve the long-term needs of inclusive sustainable development. Hence, to align the financial system of developing country especially in Africa with sustainable development, there may be need for financial innovation and efficient capital market policies, regulations and standards. Thus this study investigates the effect of money and capital market financial innovation on sustainable development in Africa.

## 2. Literature Review

The financial sector has a purpose of inter-temporal and interpersonal transfer of resources (Winkler & Jud, 1998). It helps firms to tackle issues of moral hazard and adverse selection, which lowers external financing costs (Rajan & Zingales, 1998) as well as transaction costs (Levine, 1997). The financial intermediation theory was initially formalized by Goldsmith (1969), Shaw (1973), and McKinnon (1973), who argued that the money and capital markets play a crucial role in economic development, attributing the differences in economic growth across nations to the quantity and quality of services provided by financial institutions. The expectation is that providing high-quality financial services in sufficient quantities will bring about more inclusive growth and sustainable development.

Scholars have sought to explain the relationship between finance and economic growth since the early works of Bagehot (1873), Schumpeter (1912), Gurley and Shaw (1955), Goldsmith (1969), and McKinnon (1973). According to Levine (2005), the financial system can influence savings-investment decisions and growth through various mechanisms, such as gathering and processing information on investment projects, establishing effective corporate governance, facilitating risk management and diversification, pooling and mobilizing funds, and promoting the exchange of goods and services within the economy.

The significance of financial markets as a channel for managing resources through financial intermediation has been widely recognized by researchers, academics, and policymakers as a critical determinant for economic growth (Kolapo & Adaramola, 2012; Odetayo & Sajuyigbe, 2012; Afees & Kazeem, 2011; Chiwuba & Amos, 2011; Flavia & Petru-Ovdiu, 2010; Osamwonyi, 2005; and Agarwal, 2001). For example, the capital market is considered a catalyst or lubricant that drives economic growth and development due to its essential function of mobilizing long-term funds and directing them towards productive investments while effectively allocating these funds to projects that offer the highest returns to investors (Adeusi, et al., 2013). This allocation function is critical in determining the overall economic growth (Donwa & Odia, 2011).

Levine and Michalopoulos (1998) modelled technological and financial innovation as reflecting the profit maximizing decisions of individuals and explore the implications for economic growth using the Schumpeterian endogenous growth model. The result revealed that technological innovation and economic growth will eventually stop unless financiers innovate. Without financial innovation, the existing screening technology will become increasingly obsolete as technological innovation continues. Eventually, financiers will become so poor at screening entrepreneurs that the probability of identifying successful entrepreneurs, and hence investment in entrepreneurial innovation, will fall toward zero, hence, eliminating growth.

Yuriy and Monika (2010) examined the micro-level channels of financial development and how they affect macroeconomic the level of income and export intensity. The study further investigated how financial constraints affect a firm's innovation and export activities, which provided a direct measure for innovations and firm-specific financial constraints. The study revealed that financial constraints restrain the ability of domestically owned firms to innovate and export, hence not catch up to the technological frontiers. Bayraktar and Wang (2006) perceived that banking sector openness may directly affect growth by improving the access to financial services and indirectly improve the efficiency of financial intermediaries, both of which reduce the cost of financing, stimulate capital accumulation and economic growth. These direct and indirect links were confirmed using GMM dynamic panel estimators which linked financial market development with investment and provided support for countries planning to open their banking sector for international competition.

Muhammed (2014) explored the impact of financial innovation on rural areas and how some of the innovative financial products helped in financial inclusion for poor people. It was found that a substantial gap exist between the demand and supply of financial services by the poor according to their need and accessibility. The study suggests that there is need for more financial services that must be compatible according with the need of people in rural areas.

Ajide (2016) investigated the effect of financial innovation augmented with bank competition on sustainable development in eight West African countries. Data were sourced from World Bank development indicators from years 2000-2013 and estimated using panel data,. The results confirmed that an increase in banking efficiency driven by competition and financial innovation would improve economic growth and development. While the proxies of competition were significant, the financial innovations were not significant; one displayed a negative, while the other exhibited a positive relationship with development. It concluded that policies which would drive competition and efficiency in the banking industry as well as financial innovation should be introduced to ensure effective functioning of the financial system. Bekhet and Abdul Latif (2018) examined the effects of institutions quality and technological innovation on achieving sustainable growth over the period 1995–2015. The findings of the study revealed that the interaction between governance and technological innovation positively contributes to Malaysia's sustainable growth.

Qamruzzaman et al., (2020) examined the interplay between financial innovation, human capital development, and economic growth in six South Asian countries (Bangladesh, India, Pakistan, Sri Lanka, Nepal, and Bhutan) for the period 1981-2016. They used the Autoregressive Distributed Lag (ARDL) and Granger-causality under error correction model (ECM) to analyze the data. Their findings indicated that there was a long-term relationship among financial innovation, human capital development, and economic growth in the selected South Asian countries. Additionally, both long-term and short-term elasticities from financial innovation and human capital development to economic growth were positive for each country. The Granger-causality test showed bidirectional causality between financial innovation and economic growth, as well as human capital development and economic growth, in both the short-term and long-term.

In a similar vein, Omri (2020) conducted a study to investigate the impact of technological innovation on economic progress and sustainable development in 75 countries with varying levels of income. The study aimed to determine whether technological innovation can advance economic, social, and environmental conditions simultaneously across different stages of economic development. The findings of the study indicated that in high-income countries, technological innovation has a positive impact on all three pillars of sustainable development. However, in middle-income countries, technological innovation only affects the economic and environmental dimensions, while no significant impact was found in low-income countries. The results were derived from both long-term estimates and causality analysis.

Furthermore, Innovation for Poverty Action (IPA) (2017) revealed that through financial access, farmers can acquire affordable solar energy microgrids that emit low carbon dioxide as compared to coal-burning plants. On the other perspective, it is argued that increased access to finance enhances industrialisation which boosts economic growth but results in the emission of more carbon dioxide which retard environmental sustainability (Acheampong, 2019). In the same vein, financial outreach enables people to purchase products such as refrigerators, air conditioners and other automobiles that consume more energy and emit more carbon dioxide which tampers with environmental sustainability (Maji, et al., 2017). While Qamruzzaman and Wei (2019) argued that financial innovation promotes economic activity by allowing the underserved population of society to enter the official financial system and benefit from it. By so doing, this segment of the population gets to be served with improved financial securities and instruments and encouraged to save and invest more in new and less risky financial products. This enables them to be able to acquire their necessities of life thereby improving their standard of living.

Archer and Idun (2023) conducted research to examine the contribution of banks to sustainable development in Africa, using data from 34 African economies spanning 11 years (2010-2020). The Two-step System Generalised Method of Moments technique was employed to estimate the findings. The study found that financial outreach had a significant impact, both positive and negative, on sustainable development, depending on the indicator used to measure outreach. Specifically, financial outreach had a negative relationship with carbon dioxide emissions, a positive effect on economic sustainability, and an inverse relationship with social sustainability. Furthermore, the study found that financial innovation had a significant negative association with sustainable development in Africa. The findings also revealed that financial outreach and innovation serve as moderating variables in the finance-development nexus.

## 3. Research Design and Methods

This study adopted a descriptive ex post facto research design using panel data obtained from the Word Bank Development Indicators (2020). The population of this study comprises of all countries in Africa and as at 2020. There are 54 countries in Africa according to the United Nations. In terms of land mass (30,244,049 sq. km) and population (1.033 billion), Africa is the second largest in the world. It comprises of 16 countries in Eastern Africa, 16 countries in western Africa, 9 countries in middle Africa, 7 countries in northern Africa, 5 countries in southern Africa.

Given the number of countries that made of the continent, for the purpose of this research, a convenient sampling technique was adopted by selecting countries based on the size of the economy measured using their Gross Domestic Product (GDP) and availability of consistent dataset from 2006-2020. Hence, the sample size for this study are- Nigeria, Kenya, Morocco, Ghana, Tunisia, Côte d'Ivoire, Egypt, South-Africa and Zambia.

Following the previous studies of Anthony and Aboagye, (2014); Pardi, et al., 2015, Ajide (2016); Dunne & Kasekende, (2016) and Archer et al., (2023); the model adapted in this study is presented in equation 1 below: SD = (FIF, FIB, FIC, BCT, ) .....1

$$SD_{it} = \beta_0 + \beta_1 FIF_{it} + \beta_2 FIB_{it} + \beta_3 FIC_{it} + \beta_4 BCT_{it} + \beta_5 FIC_{it} + e_{it} \dots 2$$

Where:

 $b_0$  = Intercept of the model

 $e_{it}$  = Error term

**SD=** Sustainable Development, this serves as the dependent variables and will be measured using Adjusted Net Savings (Gnegne, 2009; Blanchet, Le cacheux and Marcus, 2009; Pardi, Arifin, Salleh, & Nawi, 2015, Ajide 2016). Adjusted Net Saving (ANS), as a percentage of Gross National Income (GNI), is derived from the standard national accounting measure of gross saving by making four adjustments: (i) consumption of fixed capital is deducted to obtain net national saving; (ii) current public expenditure on education is added to account for investment in human capital; (iii) estimates of the depletion of a variety of natural resources are deducted to reflect the decline in asset values associated with extraction and depletion; (iv) deductions are made for damages from carbon dioxide and particulate emissions. The indicator is then computed by dividing ANS by GNI.

**FIF=** the ratio of liquid money to narrow money will be used to measure financial innovations, which measures financial depth and may be attributed to the various innovation in the financial sector (Dunne & Kasekende, 2016; Hye, 2009; Mannah- Blankson & Belyne, 2004).

**FIB=** the ratio of bank credit to the private sector to GDP will also be used in measuring the financial innovation. Since the bank sector channels more loanable funds to the private sector and are more involved in intermediation (Adegbite et al., 2008). Also, the revolution of technological innovations spearheaded by the application of information and communication technology can strengthen the efficiency of the banks to mobilize savings and allocate funds to productive areas, since the mobilization of saving is a cardinal role of banks especially the accumulation of small savers money (Anthony & Aboagye, 2014). **FIC=** this is used to measure the financial innovation of the capital market activities The capital market is measured using the turnover ratio i.e total volume traded as a ratio of gross domestic product, this according to Adegbite et al., (2008) measures the value of equity transactions relative to the size of the economy is an indicator of the efficiency of the capital market

**BCT=** Bank concentration (BCT) is used as a measure of market dominating power within an industry or among companies (Ajide 2016). Bank concentration (%) is measured as assets of three largest commercial banks as a share of total commercial banking assets (Financial development and structure (World bank Indicators, 2023)

BRA= Bank return on assets (BRA) measures commercial banks' after-tax net income to yearly averaged total assets. This ratio is employed as a proxy for banking sector efficiency, thereby accounting for issues concerning banks' profitability and efficiency of the banking sector potentially.

## 4. Data analysis and Discussion

Descriptor	SD		FIB	FIF	FIC
Mean	4.	596018	44.69297	51.40064	11.18460
Median	4.	028103	25.60668	37.79339	1.090448
Maximum	29	9.34616	142.4220	128.8696	124.3686
Minimum	-38	3.00585	8.120360	11.72897	-4.609343
Std. Dev.	12	2.22816	38.26531	30.97580	24.33587
Skewness	-0.	723733	1.040680	0.710081	2.483965
Kurtosis	4.	568046	2.737610	2.294203	8.580438
Jarque-Bera	25	5.61584	24.75511	14.14693	313.9967
Probability	0.	000003	0.000004	0.000847	0.000000
Observations	13	5	135	135	135
	Source:	Authors	Compilatio	n (2023	)

#### **Table 1: Descriptive Statistics**

The descriptive statistics in table 4.1 reveals the mean, median, maximum, minimum, standard deviation and Jarque Bera statistics of the proxy for Sustainable Development (SD), Financial Innovation in the Financial Sector (FIF), financial innovation in the banking sector (FIB), and financial innovation in the capital market

(FIC) so as to compare these variables. The mean value for financial innovation in the financial sector (FIF) gives a positive value of 51.4%, explaining the level of financial depth which may be attributed to innovations in the financial system in the selected countries under study, while financial innovation in the banking sector (FIB), has a mean value of (44.69%) representing the innovation in the banking sector. When compared with the mean value (11.18%) of financial innovation in the capital market (FIC), which measures the financial innovation and efficiency in the capital market the mean values suggest that there are more innovations in the banking sector than in the capital market and cumulatively as represented by the FIF, there has been increased innovation in the financial sector in Africa which may be attributed to technology adoption and availability of various services in the sector.

Furthermore, the minimum and maximum value ranges from positive to positive in the case of FIF and FIB while SD and FIC ranges from positive to negative. It implies that there may be instances where there are no changes at all or where changes are zero. The table also revealed that FIB and FIF have the highest standard deviation (38.26% and 30.97% respectively), implying that the proxy for financial innovation in the banking sector and financial sector are the most volatile factors among these variables.

Similarly, all the variables are positively skewed except for SD while only FIB and FIF are platykurtic since their value is less than three (3) which implies that the variables produce fewer and less extreme outliers than those of the normal distribution while others are greater than three, thus, leptokurtic. As shown by the Jarque Bera statistics, all the variables are significant at 1%, implying that the null hypothesis that the variables are normally distributed can be rejected.

	SD	FIB	FIF	FIC
SD	1			
FIB	0.1611	1		
FIF	0.3499	0.6889	1	
FIC	-0.0705	0.7080	0.3191	1

Table 2 Multicolinearity Test and Correlation Matrix

Compilation

Source:

Authors

(2023)

Correlation coefficient is used to investigate the presence of multicolinearity among the variables or otherwise and is presented in Table 4.2 below: The table shows that FIF AND FIB are positively correlated with SD expect for FIC which have a negative relationship. Similarly, FIB, FIF and FIC are positively correlated. The highest of the correlation coefficient is 70.8% (FIB and FIC), suggesting that there may be presence of multicolinearity with the variables while other have relatively low coefficients.

Furthermore, the unit root test was carried out to ascertain the order of integration of the variables and confirm if they are non-stationary using three different unit root test which are presented below:

	Levin, Lin & Chu t*	ADF - Fisher Chi-square	PP - Fisher Chi-square
SD @Level	-1.53649 (0.0622) **	19.5649 (0.3578)	32.4292 (0.0195)*
SD @ First Diff	-6.93121 (0.0000)*	66.0685(0.0000)*	115.465 (0.0000)*
FIB @Level	-1.05919 (0.1448)	31.9813(0.0221)*	43.4474 (0.0007)*
FIB@ First Diff	-5.70364(0.0000)*	49.0455(0.0001)*	102.007(0.0000)*
FIF @Level	1.21599 (0.8880)	21.2047(0.2692)	36.5634(0.0060)*
FIF @ First Diff	-0.79610 (0.2130)	34.5680(0.0107)*	58.4479 (0.0000)*
FIC @Level	-32.5979(0.0000)*	53.6950(0.0000)*	28.3490(0.0569)**

#### **Table 3 Panel Unit Root Test**

Source: Authors Compilation (2023)

NB: Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other

tests assume asymptotic normality. \* 5%; \*\* 10%

It is evident from the table above that most of the variables are not stationary at level, however, they were stationary at first difference with the exemption of FIC, Thus, it implies that there is a strong indication that these variables are multi-levelled integrated. Having fulfilled the multicolinearity assumption and confirmed that the variables exhibit multileveled stationary and the none of them is I(2), the study conducts the Generalized Method of Moments for panel data to ascertain the effect of financial innovation on sustainable development in Africa.

## **Table 4 Panel Generalized Method of Moments**

Variable	Coefficient	Std. Error	t-Statistic	Prob.		
D(SD(-1))	-0.1676	0.0558	-3.0013	0.0034*		
D(FIB(-1))	0.0696	0.2745	0.2537	0.8002		
D(FIF(-1))	-0.3145	0.3924	-0.8014	0.4247		
FIB(-1)	0.1782	0.3248	0.5486	0.5844		
Effects Specification						
Cross-section fixed (first differences)						
Mean dependent var	0.0451	S.D. dependent var		6.9442		
S.E. of regression	6.9151	Sum squared resid		4973.264		
J-statistic	6.8654	Instrument rank		9		
Prob(J-statistic)	0.2308					
Arellano-Bond Serial Correlation Test						
Test order	m-Statistic	rho	SE(rho)	Prob.		
AR(2)	-0.0823	-298.6410	3628.49863	0.9344		

Source: Authors Compilation (2023)

The panel Generalized Method of Moments is presented in Table 4.4 above and it revealed that a period lag of the proxy used in measuring SD has a negative coefficient (-0.1676) and statistically significant at 5%. This implies that previous years' achievement in terms of sustainable development negatively affects sustainable development in current periods. Similarly, the coefficient of proxy used in measuring financial innovation in the financial sector (FIF) also presented a negative value (-0.3145), implying that the innovations in the financial sector are not significantly effective in spurring sustainable development in Africa.

This is supported by the research conducted by Archer and Idun (2023), financial outreach is positively and negatively associated with sustainable development, while financial innovation is negatively linked with sustainable development in Africa. Similarly, Acheampong (2019) argues that greater access to finance leads to increased industrialization and economic growth, but this may also result in higher carbon dioxide emissions, which hinders environmental sustainability

On the other hand, the proxy measuring financial innovation in the banking sector and capital market shows a positive value (0.0696 and 0.1782) respectively. This implies that a 1% increase in innovation in the banking sector and capital market will result to about 6% and 17% increase in sustainable development in Africa. This reaffirms the study of Bekhet and Abdul Latif (2018) who found that the interaction between governance and technological

innovation positively contributes to Malaysia's sustainable growth. Ajide (2016) also concluded that the proxies for measuring financial innovations were not significant, while one displayed a negative coefficient, the other exhibited a positive relationship with sustainable development.

Furthermore, the J-statistics is 6.89 with probability of 0.2308, which is relative small and statistically insignificant, suggesting that the model is a good fit for the data, and that the moment conditions are satisfied. While the serial correlation test used in checking for autocorrelation in the errors of the model, which can lead to biased and inefficient parameter estimates was estimated using Arellano-Bond Test, shows that that there is no autocorrelation in the errors, hence, this analysis can be relied on for policy formulation and implementation.

According to Qamruzzaman and Wei (2019), financial innovation can stimulate economic growth by enabling underserved populations to participate in the formal financial system. This allows them to access better financial instruments, save more, and invest in less risky financial products, ultimately improving their standard of living by enabling them to meet their basic needs.

In addition to promoting economic growth, deepening the financial system through banks can also contribute to social sustainability. Huang et al. (2022) argue that denying people access to formal financial systems leads to poverty, which in turn leads to issues such as illiteracy, inadequate healthcare, and lack of proper nutrition. The Innovation for Poverty Action (IPA) (2017) further suggests that financial access can allow farmers to acquire affordable solar energy microgrids that emit less carbon dioxide than coal-burning plants, thus contributing to sustainable development. Therefore, it can be argued that financial innovation has the potential to increase the demand for money, provided payment systems improve and individuals' demand for more liquid assets is channeled into productive sectors, ultimately leading to sustainable economic growth in Africa.

## 5. Conclusion

This study examines the effect of financial innovation on sustainable development in selected countries in Africa for the period of 2006-2020. Data were sourced from World Bank Development Indicators and panel data estimations will be carried

ISSN: 2197-5523 (online)

out. The GMM Panel Estimator was used in ascertaining the effect of financial innovation on sustainable development. Evidence from prior studies revealed the differential effects of different financial innovations adopted in the financial system of the different countries since the growth effect of financial innovation is sensitive to the choice of proxy.

The study revealed that financial innovation affects sustainable development both positively and negatively, depending on the proxy used in measuring financial development. When proxied with innovation in the financial sector, the result is a negative effect on sustainable development, however, when innovation in the banking sector and capital market are applied, the result is a positive effect on sustainable development. This further implies that a reduction in demand for money caused by financial innovations could deter economic growth and development. This implies that individuals would move away from more liquid assets to less liquid assets, which in turn discourage consumption.

On the other hand, financial innovations could potentially lead to an increase in money demand if payment systems improve and individuals demand more liquid assets, hence, consumption is encouraged. By implication, production would increase, leading to an increase in growth and development. However, in both cases the effects are statistically insignificant. This reaffirm the findings of Adu, et al., (2013) who revealed that whether financial development is good or bad for growth depends on the indicator used to proxy for financial development.

To achieve a substantial number of Sustainable Development Goals (SDGs) in Africa, it is recommended that governments take steps to increase access to and usage of financial services especially in rural areas. This can be achieved by providing basic education, income, and healthcare to excluded groups who are often unable to access financial services. Additionally, policymakers and governments should work with financial service providers to ensure that loans are available at reasonable and flexible interest rates to support underprivileged individuals and vulnerable businesses, helping to increase consumption and expand their business activities. We also propose that policies which would drive efficiency in the banking industry and capital market as well as financial innovation should be introduced to ensure effective functioning of the financial system in Africa

#### References

- Acheampong, A. O. (2019). Modelling for insight: Does financial development improve environmental quality? Energy Economics, 83, 156-179.
- Adeusi, S.O., Sulaiman, L.A., & Azeez, B. A. (2013). Impact of Capital Market Development on the Nigerian Economy: A Post-SAP Analysis. Journal of Economics and Behavioral Studies, 5(1), 1-7
- Afees, A.S & Kazeem, B.A (2010). The Stock Market and Economic Growth in Nigeria: An Empirical Investigation. Journal of Economic Theory, 4, 65 – 70.
- Agarwal, S. (2001). Stock Market Development and Economic Growth: Preliminary Evidence from African Countries.
- Ajide F. M. (2016). Financial Innovation and Sustainable Development in Selected Countries in West Africa. Journal of Entrepreneurship, Management and Innovation (JEMI), 12 (3), 85-111
- Anthony, A. I., & Aboagye, Q.Q. (2014). Bank competition, financial innovations and economic growth in Ghana. African Journal of Economic and Management Studies, 5(1), 30-51.
- Archer, C., & Idun A. A (2023). Financial Outreach, Financial Innovation and Sustainable Development in Africa. Research Square, <u>https://doi.org/10.21203/rs.3.rs-2538099/v1</u>
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. The Review of Economic Studies, 58(2), 277-297.
- Bagehot, W. (1873). Lombard street: A description of the money market. London, England: John Murray.
- Bayraktar, N., & Wang, Y. (2006). Banking sector openness and economic growth. World Bank Policy Research Working Paper 4019.
- Bekhet, H.A., & Abdul Latif, N.W.A., (2018). The impact of technological innovation and governance institution quality on Malaysia's sustainable growth: evidence from a dynamic relationship. Technol. Soc. 54, 27–40.
- Blanchet, D., Le Cacheux, J., & Marcus, V. (2009). Adjusted net savings and other approaches to sustainability: Some theoretical background. Retrieved from www.insee.fr/en/publicationsetservices/does\_doc\_travail/G2009-10.pdf
- Chinwuba, O. & Amos, O.A (2011). Stimulating Economic Development through the capital market: the Nigerian experience. JORIND 9(2).
- Costanzo, L. A., Keasey, K., & Short, H. (2003). A strategic approach to the study of innovation in the financial services industry: The case of telephone banking. Journal of Marketing Management, 19(3/4), 259-281.

- Demirgue Kunt A., & Levin R. (1996). Stock Market Development and Financial Intermediaries: Stylized Facts. The World bank Economic Review, 10(2),241-265.
- Dimitrios S., & Mention A. (2013). Financial Innovation and Sustainable Development. Retrieved from

https://www.researchgate.net/publication/275580245

- Donwa P., & Odia J. (2010). An Empirical Analysis of the Impact of the Nigerian Capital Market on Her Socio-economic Development. J Soc Sci, 24(2),135-142
- Dunne, P. J., & Kasekende, E. (2016). Financial innovation and money demand: Evidence from Sub-Saharan Africa. South Africa: Economic Research Southern Africa (ERSA).
- Flavia, B., & Peter-Ovidiu, M. (2010). Capital Market and Economic Growth: The case of Romania. Annals of the University of Petrosani, Economics 10 (2)
- Gnegne, Y. (2009). Adjusted net savings and welfare change. Ecological Economics, 68(4), 1127-1139.
- Goldsmith, R.W. (1969). Financial structure and development. New Haven, CT: Yale University press.
- Gurley, J.G., & Shaw, E.S. (1955). Financial aspects of economic development. American Economic Review, 45, 515-538
- Huang, W., Gu, X., Lin, L., Alharthi, M., & Usman, M. (2022). Do financial inclusion and income inequality matter for human capital? Evidence from sub-Saharan economies. Borsa Istanbul Review, 3(8), 24-35.
- Hye, Q., & Adnan, M. (2009). Financial innovation and demand for money in Pakistan. Asian Economic Review 51(2), 219-228.
- IPA, 2017. Innovation for poverty action. In: Climate change and financial inclusion.
- Kolapo, F.T., & Adaramola, A.O (2012). The impact of Nigerian capital on economic growth. International Journal of Developing Studies. 1(1), 11-19
- Levich, R M., Corrigan, E. G., Sanford C. S., & Votja G. J. (1988). Financial Innovations in International Financial Markets. University of Chicago Press 215 – 277
- Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. Journal of Economic Literature, 35, 688-726
- Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion & S. Durlauf (Eds.), Handbook of Economic Growth, 1 (865-934). Amsterdam, Netherlands: Elsevier.
- Maji, I. K., Habibullah, M. S., & Saari, M. Y. (2017). Financial development and sectoral CO2 emissions in Malaysia. Environmental Science and Pollution Research, 24(8), 7160-7176.
- McKinnon, R. I. (1973). Money and capital in economic development. Washington D.C.: Brookings Institution.

Mention, A. L. (2011). Innovation for financial services. Innovation Management. Retrieved from

http://www.innovationmanagement.se

- Mention, A.L., & Torkkeli, M. (2012). Drivers, processes and consequences of financial innovation: a research agenda, International Journal of Entrepreneurship and Innovation Management, 16 (1/2), 2012
- Muli W. M., Goko T. W., Kitheka S. S., Ngunjiri R. N., & Mulwa J. M. (2013). Financial Innovation as a Competitive Strategy: The Kenyan Financial Sector. Journal of Modern Accounting and Auditing, 9 (7), 997-1004
- Nielsen, P. N. (2006). Understanding dynamic capabilities through knowledge management. Journal of Knowledge Management, 10(4), 59-71.
- Odetayo, T.A & Sajuyogbe A.S (2012). Impact of Nigerian capital market on economic growth and development. International journal of arts and commerce. 1(5), 1-8.
- Osammonyi, I. O. (2005). Capital Market imperfection and Community Economic Development of Nigerian. Academy of Management Journal. 1(4), 34-49
- Pardi, F., Arifin Md. Salleh, A. M., & Nawi, A. S. (2015). Determinants of sustainable development in Malaysia: A VECM approach of short-run and long-run relationships. American Journal of Economics, 5(2), 269-277.
- Qamruzzaman, M., & Wei, J. (2019). Financial innovation and financial inclusion nexus in South Asian countries: Evidence from symmetric and asymmetric panel investigation. International Journal of Financial Studies, 7(4), 61-80.
- Qamruzzaman, M., Jianguo, W., Jahan, S., & Yingjun, Z. (2021). Financial innovation, human capital development, and economic growth of selected South Asian countries: An application of ARDL approach. International Journal of Finance & Economics, 26(3), 4032-4053.
- Rajan, R., & Zingales, L. (1998). Financial dependence and growth. American Economic Review 88, 559-586.
- Schumpeter, J. (1934). The theory of economic development. Cambridge, Mass.: Harvard University Press. First published in German, 1912. Republished New York: Oxford University Press, 1961.
- Shaw, E. S., (1973), Financial Deepening in Economic Development. New York: Oxford. University.
- Simon J., & Kwak J. (2012). Is Financial Innovation Good for the Economy? University of Chicago Press, 12, 1-17
- UNEP, (2015). Aligning the Financial Systems in the Asia Pacific Region to Sustainable Development. UNEP Inquiry on Design of a Sustainable Financial System. Geneva, Switzerland

Winkler, D. T. & G. D. Jud. (1998). The Graduated Payment Mortgage: Solving the Initial Payment Enigma, Journal of Real Estate Practice and Education, 1(1), 67-79.