KEYNESIAN AND POST-KEYNESIAN MODELS ON BANKS IN AFRICA

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Abstract

In the present paper, we aim at filling the lacuna created by the lack of a multiplicity of empirical works on Keynesian and post-Keynesian models on banks in Africa. Based on the case of banks and economic growth in 20 Sub-Sahara African countries for the 1990-2021periods, we employ the Granger causality tests in heterogeneous panels developed by Dumitrescu and Hurlin (2012), the Fixed Effect Ordinary Least Squares method, the Mean Group Method and the Generalized Method of Moments to conclude that, in the short and long run, economic growth precedes banks development as justified by Keynesian and Post-Keynesian bank models.

Keywords: Keynesian; Post-Keynesian; Effective demand; Banks, Africa.
JEL Code: E12; E11; G21; N17.

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1. Introduction

Banks play a central role in the Keynesian and post-Keynesian theoretical framework. For example, the Kalecki (1939) prior-investment approach reiterated the important role of banks due to the fact that credit allows investment to expand beyond the existing level of profit. When the entrepreneur has received sufficient funding for his profitable investment, profits derived from his investment may be used to repay his bank loans and consequently to save. This means that from economic expansion, an entrepreneur will demand bank services such as credit, facilitated by low interest rate, which will then be invested and subsequently stimulate growth. The present Keynesian effective demand procedure is termed the demand-following hypothesis in the present paper.

More importantly, post-Keynesian Economist models on banks are built on the above Keynesian effective demand approach. According to the post-Keynesian prior-investment method, means of payment are issued by commercial banks when entrepreneurs demand money in order to invest and produce. So, financing is not limited by available savings but by entrepreneur demands. The credit-driven activation of money and its determination by money demand have been highlighted by Moore (1988). Similarly, proponents of Keynes (1936) such as Robinson (1952) and other scholars like Chick (1983, 1986) argue that while credit creation may limit growth in less advanced financial systems, it is seen as endogenous and responsive to demand requirements in more sophisticated systems. This argument implies that as a financial system becomes more developed, there is a greater probability of growth leading to finance. According to Robinson (1952), financial development follows growth as defined in the demand-following hypothesis.

However, Keynesian and post-Keynesian Economists such as Minsky (1978) and Docherty (2020), argued that in the course where the economy is expanding rapidly followed by an exuberant demand growth, banks may react to the latter very high demand by supplying unwarranted loans causing excessive investment prone to speculative pressures and to bad loans which will reduce banks' profitability and limit their ability to issue new credit, fostering greater uncertainty in the banking system and, in turn, elevated financial stability risks. Systematic bank crisis will, therefore, likely set in characterised by a sharp explosion in both private and public debt, collapse of asset market and decline in output and employment.

Our discussion on the African banking sector indicates that the post-Keynesian demand-following hypothesis implemented in African countries from the 1960s to the mid-1980s characterised by low interest rate policy boosted bank loans, investment and growth. However, in the last half of the 1980s, several African countries implemented the neo-classical supply-leading hypothesis policies advocated and prescribed by the IMF and the World Bank aimed at removing interest rate controls and achieving positive real interest rates on bank deposits and loans to increase savings and the total real supply of credit, both of which encourage greater investment which will boost economic growth (Nalunga, 2023). A number of studies such as Le Gall, & Leroux (2004), Fowowe (2013), Ikhide (2015), Misati & Nyamongo (2012) show that systemic banking crises occurred in many SSA (Sub-Sahara African) countries, for example, Cameroon (1988–1991), Nigeria (1991–1995), Ghana (1982–1989) and Kenya (1993–1995) immediately after they had implemented the neo-Classical supply-leading procedure.

The above crises show that the relationship between banks and economic growth is a controversial issue which is reflected in conflicting econometric tests results reviewed in this article. We, therefore, contribute to the existing literature by revisiting Keynesian and post-Keynesian model theories focussing solely on banks and testing their robustness in African countries using various econometrics methods. The remaining sections of the present article are structured as follows: Section 1 reviews the theoretical literature on banks. Section 2 undertakes the review of the empirical literature. Section 3 discusses descriptive statistics and econometric analysis and Section 4 concludes.

2. Literature Theoretical Review

2.1. Keynesian Economists Models on Banks

Keynes (1937) emphasised on the process of transforming short-term assets that are demanded by savers into long-term sources of funding. Keynes argued that firms find permanent holders of their long-term liabilities that will allow them to pay back short-term bank loans. Kalecki (1939), on the other hand, did not distinguish long-term and short-term finance. Kalecki pointed out that banks provide the finance (long-term and short-term) required enabling firms to increase production of investment goods.

2.1.1. Keynes Model

Keynes viewed the money supply as endogenous. He stated that, the decision to supply money as finance for investment via low interest rate is a significant determinant of the level of economic expansion. Thus, while Keynes refuted the "classical" view that savings can constraint investment, he argued that bank loans via low interest rate determine investment, and investment in turn determines savings. Hence, if the banking system opts to provide loans and the anticipated investment from the new issuances materializes, economic growth will be stimulated and will be sustained by an adequate amount of savings that precisely caters to the new investment (Keynes, 1937, p.248). Money is, thus, an endogenous variable, with its determination involving both the desire by firms to invest, and the willingness of banks to lend. Investment can be constrained through shortage of credit rather than a shortage of savings (Keynes, 1937, p.222).

A multiplier would then allow the process of growth to take place. As a result of investment and income are generated activating the multiplier since part of the income is used for consumption. Aggregate output and income increase by using part of that revenue for consumption. Due to the fact that savings are part of income which does not go to consumption, therefore, they constitute a residual. Consequently, the role of savings will be to fund investment necessary for a sustainable economy (Keynes, 1937). The equality between savings and investment is enabled by the multiplier via output adjustment. In other words, if for example, savings are lower than investment, the multiplier will enable income to increase up to the level where savings equate investment. According to Keynes (1937), therefore, the equality between savings and investment is caused by the variation of income and not by that of interest rate.

2.1.2. Kalecki Model

Kalecki (1939) investment theory points out that capitalists may desire to invest more their corresponding saving from their current profit after consumption expenditure, because their investment activity is not determined by previous profit, but by expectation of the future profitability of the investment project. Kalecki argues that the additional funds in excess of savings come from the creation of money by banks which therefore, accommodate the demand for additional investment finance of capitalists and replenish their decreased

reserve fund by the lowering of lending interest rate, which may spur the investment decision of capitalists. Thus, Kalecki asserts that without credit growth, there would be no fluctuation of investment activity, and consequently there would be no major economic growth fluctuations. Expansion of economic activities is strictly connected with credit growth (Kalecki, 1990, p.148). The expenditure of some capitalist is converted into profit for other capitalists, and this profit flow back into the bank in the form of deposits (Kalecki, 1990, p.80). Then, there is no additional debt or additional credits in the side of capitalists as a whole or in the side of the banking system. That's why the circle will close. (Kalecki, 1990, p.137). Therefore, for Kalecki, the link to economic growth goes through profit and investment facilitated by low interest rate. Investment can be constrained through shortage of credit rather than a shortage of savings. Banks do not need prior savings or reserves to expand their assets. Rather, the necessary savings and reserves are created by loans.

2.2. Post-Keynesian Economists Models on Banks

The interest rate impact on effective demand is the central tenet in the post-Keynesian approach to monetary theory in Africa. The rate of capital accumulation and economic growth rate are determined by effective demand. Effective demand is in turn affected by the distribution of income which is itself mainly influenced by class struggle. Post-Keynesian model is driven by the demand for credit. Arestis (1996, p.118) argued that the driving force of the economic system is seen to be effective demand, especially investment, so that capital accumulation along with expectations and distributional effect are at the heart of both growth and business cycle theories. Arestis also asserted that the formulation of the demand for credit requires entrepreneurs to predict the pattern of effective demand. The latter point was elucidated by Burkett and Dutt (1991) who show that an increase in the interest rate will make entrepreneurs more pessimistic about future profits and may lead to the fall in the current rate of profit which will in turn affect investment and economic growth substantially.

2.3. The Demand-following Hypothesis

Keynesian and post-Keynesian such as Robinson (1952) and other followers of Keynes (1936) approach termed the demand-following hypothesis suggests that the banking system development arises from growth in the real sector (Arestis & Demitriades, 1997). This shows that causality runs from the real sector to the banking sector. According to Odhiambo (2009), real sector development boosts the demand for bank services such as

loans. In other words, the latter Keynesian and post-Keynesian hypothesis asserts that financial deepening occurs due to banks credit creation resulting from economic expansion, which will then stimulate investment and motivate growth. That is, economic growth characterised by the expansion of economic activity, is expected to create the demand for bank services such as loans, creating a supply response from banks. The latter sequences indicate that the economy is demand and not supply determined, which means that causality extends from economic growth to the formal banking system. For example, Robinson (1952, p.86) expressed the latter causality by stating that "where enterprise leads finance follows". Furthermore, Lucas (1988), Jung (1986), Goldsmith (1969), Ndlovu (2013) and Kar & Pentecost (2000), stressed that from economic growth to financial development is the causality direction, that is, the increase in demand for financial services is a result of economic growth, which leads to the expansion of the financial sector.

The demand-following hypotheses is frequently opposed to supply-leading supported by Classical and neo-Classical Economists such as Schumpeter (1911), Beck and Levine (2004), McKinnon (1973), Levine (2005), Demirgüç-Kunt (2006), Agu and Chukwu (2008), Calderon and Liu (2003) among others who assert that financial development has a positive association with economic growth and it is caused by the enhancement in the effectiveness of capital accumulation or an increase in the rate of savings. More specifically, McKinnon (1973) and Shaw (1973) stated that an increase in the real rate of interest leads to an increase in savings and the total real supply of credit, both of which encourage greater investment which will boost economic growth. This means that investment and the subsequent economic growth could be constrained by insufficient savings.

In summary, we could say that, banks lie at the heart of Keynesian and post-Keynesian principles where economic activity expansion stimulates demand for bank loans. Banks will then react to the latter demand by supplying the desired loans which will stimulate investment and economic growth. Therefore, growth may be constrained by credit creation by bank. We could then infer that banks stability is integral to both Keynesian and post-Keynesian who argue that defaults can arise either from poor lending decisions or significant economic events that affect the cash flows of bank borrowers. More importantly, high investment advocated by the above schools of thought may lead to bank crisis due to the fact banks may become less cautious in extending credit and firms may correspondently be less cautious in borrowing as indicated in the next section.

2.4. Keynesian and Post-Keynesian Approach to Bank Crises

In the General Theory (1936, p.100-102), Keynes warned of the effects on aggregate demand of sinking funds being used to finance luxury consumption by households, as this would exacerbate depressive pressures by lowering consumption expenditure in favour of savings. Keynes famously stressed the effect of uncertainty on liquidity preference. In a post-General Theory paper, Keynes noted that banks "play a crucial role in the transition from a low to a high level of economic activity" (Keynes, 1937). In other words, Keynes saw banks and financial markets in general as part of a transmission mechanism that allowed crises of repayment and bankruptcy to spread and undermine overall economic prosperity during the 1920's and 1930's.

Many post-Keynesian Economists have based their work on the above Keynes's concepts of uncertainty and risk, which form the core of the post-Keynesian Economics (Hamouda and Harcourt, 1988). For example, following Keynes, Minsky argues that real economic expansion leads to exuberant demand growth and inflation processes. However, Minsky argues that the key to financial instability is the rise in debt quotas during the expansion process. Minsky's Financial Instability Hypothesis focuses on the relationship between finance and investment (Minsky 1978, p.31). He went on to say that financial bubbles almost always lead to excessive investment in specific sectors that become unviable as normal conditions return. This is true not only for investment in areas prone to speculative pressures such as real, but also for investment in machinery and equipment. For example, in Japan at the end of the 1980s, the united States at the peak of dot-com bubble in the mid-1990s, and East Asia at the peak of the 1997 crisis.

Minsky (1978) went on to argue that consumption booms caused by asset price inflation and credit growth can drive aggregate demand, lowering household savings and increasing indebtedness during an expansion. For example, in Latin America during the 1990s, capital inflows tended to be associated with consumption booms. Similarly, most of the growth in the U.S. economy during the mid-1990s was driven by higher consumer spending fuelled by a speculative boom in equity and real estate markets, which was made much easier by mortgage equity withdrawals. As the economy expands, economic units become more and more vulnerable as they move into an increasingly risky constellation. According to Keynes' (1930, p.139) widow's cruse argument, high investment results in high

unallocated profits. But this does not stop higher leverage, because profits are not evenly distributed across the enterprise sector, and profit receivers can divert profits to lavish themselves with luxury consumption, eliminating the ability to finance investment from profits. In turn, this increases the pressure on debtors, forcing them to liquidate their assets, triggering a process of debt deflation and deepening the contraction in economic activity.

Joseph Stiglitz is another post-Keynesian economist who based his work on Keynes's and developed the "New Keynesian" approach. Stiglitz did not argue against uncertainty, but rather argued that there is asymmetric information in the economy between borrowers and lenders. Stiglitz's New Keynesian model for the credit market assumes that borrowers have informational advantages over lenders of two kinds: information about borrower capability and borrower plans to use and repay the loans they receive. Lenders' optimal response to this asymmetry information is to ration credit or to use signalling to screen borrowers. Stiglitz's principal-agent approach to asymmetry information is only marginally related to Keynes. While the General Theory does distinguish borrowers' and lenders' risk, it does not discuss asymmetry information. The real connection to Keynes lies in Stiglitz's model's assumption that markets can be "in equilibrium" without clearing (in which supply is systematically lower than demand at a market interest rate). There is no single optimum equilibrium, as Stiglitz and Weiss (1981) point out on their path breaking model of the credit lending market; there are still unresolved borrower/lender disputes after equilibrium trading has taken place.

Moreover, post-Keynesians such as Minsky (1986) and Docherty (2020) advocate for a financial system that aims to mitigate financial instability. According to Minsky, this involves implementing measures such as capital adequacy requirements to control the level and growth of bank assets (Minsky 1986, p.320-21). Similar to Keynes, Minsky also emphasizes the importance of preventing economic downturns and recommends the establishment of a Big Bank, which acts as a lender of last resort during debt deflations and credit crunches. Additionally, a Big Government, acting as a spender of last resort, is proposed to prevent economic contraction and unemployment. However, it is acknowledged that these interventions can create moral hazard, underscoring the significance of robust financial regulations. Docherty (2020) further highlights the post-Keynesian approach to prudential bank regulation, which encompasses liquidity and capital requirements, as well as

a macro prudential framework that allows for counter-cyclical adjustments in response to changes in systemic risk caused by internal factors.

2.5. African Banking Sector

According to Bruel (1918) formal banks in Africa date back to the early 1800s. The activities of multinational corporations, the financial transactions of the colonial government, the decline of the barter system of trade and the increasing acceptance of the colonial government currency contributed to the emergence of formal banks in Africa. It is only after World War II that more major banks began operating in Africa (Tche, 1997).

Today, the African banking system comprises Central Banks and deposit-taking institutions. While Central Banks maintain technical independence from government control, they collaborate closely with the Ministries of Finance in their respective countries to develop and execute macroeconomic policies. The deposit-taking institutions consist of local banks as well as branches or subsidiaries of foreign banks. In many African countries, the banking sector is predominantly controlled by state-owned banks or a small number of large, occasionally foreign, banks. For instance, in Algeria, state-owned banks oversee more than 90% of the overall banking deposits and assets (IMF, 2016).

Since the 1960s to the mid-1980s, many African governments via their respective Central Banks employed demand-following hypothesis represented by low interest rates to increase loans, investment and economic growth as indicated in the previous paragraphs. However, in the last half of the 1980s, several African countries implemented the neo-Classical supply-leading hypothesis policies advocated by the IMF and the World Bank aimed at removing interest rate controls and achieving positive real interest rates on bank deposits to increase savings and the total real supply of credit, both of which encourage greater investment which will boost economic growth (Nalunga, 2023). The more interesting and controversial contributions to these policies are related to McKinnon (1973) and Shaw (1973). In early 1980s concern was being expressed on African Central Banks' demand-following hypothesis represented by low interest rate policy. After a preliminary survey of various African banking systems, the International Monetary Fund (IMF) and the World Bank prescribed the neo-Classical supply-leading hypothesis policies. In addition to the increase in the real interest rates, efforts were made to enhance banks' efficiency by increasing competition and by improving management. To enhance operational performance, banks

were granted greater autonomy and responsibilities. This autonomy was facilitated by the government's sale of shares in many banks. In Morocco, for instance, credit control and obligatory liabilities were abolished by the end of the decade. Additionally, an interbank foreign exchange market was established, and interest rates were raised (Jbili et al., 1997). Similarly, in Cameroon, banks also required increased autonomy and responsibilities, which were facilitated by the sale of government shares (Tche, 1997). According to Nalunga (2023), unregulated interest rates in Uganda was part of a broader set of stabilization and reform policies implemented since 1987 under the guidance of the IMF and World Bank Structural Adjustment Programs (SAPs). As part of these measures, the government allowed the free flow of capital between Uganda and the rest of the world, enabling residents and non-residents to hold foreign exchange-denominated accounts within the domestic banking system. Residents were also permitted to hold foreign exchange-denominated accounts and instruments outside the country. The liberalization of the capital account in Uganda aimed to bridge the savings-investment gap, promote sustainable long-term growth, and address the fiscal deficit for financing infrastructure projects (Nalunga, 2023).

Many post-Keynesian Economists such as Tuna Mana (2024), Arestis and Sawyer (2016) were sceptical about the success of the above unregulated interest rate policy. Caprio & Klingebiel (1996) and Stiglitz (1994) also expressed the concern that the neo-Classical supply-leading procedure may lead to bank crisis as banks find greater opportunities for risk taking. Arestis and Demetriades (1993) in their Kalecki-type model found unrealistic the supply-leading hypothesis procedure assumption of perfect competition in the financial system since there is a barrier to entry in the banking industry. The presence of the adverse selection and moral hazard problems renders African countries banks imperfectly competitive. Arestis and Demetriades, therefore, advocated the strong need for bank regulation rather than the unregulated market forces underlining the supply-leading hypothesis procedure. They argued for example that, bank supervision will stop bankers with a sufficiently high discount rate from exercising a monopoly power over their customers since the interest rates under the supply-leading hypothesis programme is expected to rise much higher due to a lack of a stable price equilibrium level in African countries financial markets.

Indeed, during the supply-leading procedure from the 1980s, having followed carefully the prerequisites prescribed by the IMF and the World Bank, many African countries

generated severe macroeconomic and financial instability. A number of studies such as Le Gall, & Leroux (2004), Fowowe (2013), Ikhide (2015), Misati & Nyamongo (2012) show that systemic banking crises occurred in many SSA countries [for example, Cameroon (1988–1991), Nigeria (1991–1995), Ghana (1982–1989) and Kenya (1993–1995)] immediately after they had implemented the supply-leading procedure. Table 1 shows the progress that was made in an attempt to improve the economy of Cameroon following the prescription of the IMF and the World Bank under the Structural Adjustment Programmes. During the demand-following hypothesis period (1970-86), Cameroon enjoyed a GDP growth averaging 7.7% and investment ratio averaging 24.8%. By contrast, during the supply-leading procedure period (1987-93), Table 1 indicates that GDP plunged to the lowest level of -5.5%. While the investment ratio reduced to 18.2. The latter assessment of the supply-leading hypothesis in Africa is supported by Demirgüç-Kunt and Detragiache (1998) who studied the empirical relationship between banking crisis and supply-leading procedure in 53 countries during 1980 and 1995. They found that bank crises are more likely to occur due to the supply-leading procedure employed.

Table 1- Demand-Following Hypothesis and Supply-Leading Hypothesis in Cameroon

Indicator	1970-86 (Demand-Following Hypothesis)	1987-93 (supply-leading Hypothesis)
Real interest rate	-4.7	3.8
M3/GDP	18.9	21.4
Investment/GDP	24.8	18.2
GDP growth	7.7	-5.5
Change in real M3/real saving	6.1	-12.7
Change in GDP/investment	70.8	-34.1
Inflation	10.8	3.9
Volatility of inflation	3.7	7.1

Source: Author (1997)

3. Empirical Review

The main purpose of the present section is to undertake a critical survey of the empirical literature on financial development and economic growth models influencing policies pursued in African countries in order to highlight potential issues deemed to break new ground in this study.

Having reviewed the Keynesian and post-Keynesian models on banks, we now turn to the review of econometric tests on the demand-following hypothesis.

Table 2- Summaries of Econometric Tests on the Demand-following Hypothesis

No	Authors	Time Period	Study Area	Test Type	Causality from Economic Growth to Banks
1	Afolabi (2022)	1981-2018	Nigeria	Granger causality test	Yes
2	Aka and Konan (2023)	1962-2020	Côte d'Ivoire	Frequency domain causality test	Yes
3	Belinga. et al (2016)	1969-2013	Cameroon	(ADF) and (VECM)	No
4	Enongene (2023)	1980-2020	Cameroon	ARDL and multivariate Granger causality test	No
5	Göv and Yilanci (2023)	1990-2014	30 African and Latin American Countries	Granger Causality Test	Yes
6	Magaji et al (2021)	1960 -2019	Nigeria	Granger causality Test	No
7	Meshesha and Makoni 2023	2000-2019	Sub-Saharan African	autoregressive distributed lags (ARDL)	Yes
8	Mustafa and Yüzüncü (2022)	2010-2020	Mexico, Indonesia, Nigeria and Turkey	Panel Causality test	Yes
9	Olayiwola (2022)	2000-2019	Sub-Saharan Africa	Panel Causality test	No
10	Olufemi, Oladapo e Oseko. 2015	1981-2013	Nigeria	Granger Pairwise causality test	Yes
11	Pinshi (2020)	2004 - 2019	Democratic Republic of the Congo	Granger Causality Test	Yes
12	Safa and Ali (2023)	1954 – 2020	Algeria	VAR-Granger causality test	Yes
13	Songul, Ilhan and Ali, A., 2009	1975-2005	Sub-Saharan Africa	panel co-integration and panel GMM	Yes
14	Tekilu and Jemal (2019)	1975 - 2016	Ethiopia	Granger Causality Test	No

Source: Author

The conflicting results from recent econometric tests reviewed in this section indicate that much more empirical work is needed before the Keynesian and post-Keynesian models

can be appraised. In the next section, we endeavour to undertake an analysis which aims at filling the gap created by the few and conflicting econometric work on the demand-following hypothesis.

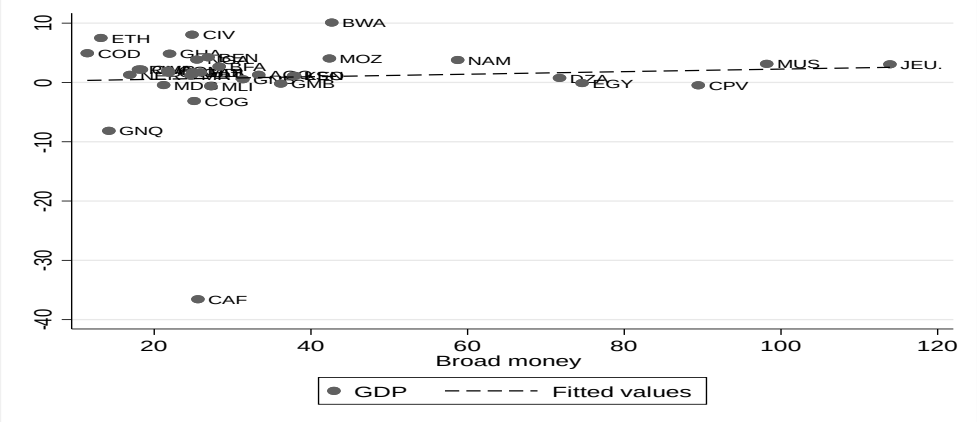
4. Data and Methodology and Analytical Framework

4.1. Data

4.1.1. Influence of Banks on Growth on Economic Growth in SSA

In the Keynesian and post-Keynesian prior-investment approach of effective demand, due to economic expansion, an entrepreneur will demand bank services such as credit, which will then be invested and consequently stimulate economic growth. Investment can be constrained through shortage of credit rather than a shortage of saving (Keynes 1937, p.222). In the present graphical representation, bank services are represented by broad money, while economic growth are represented by the Gross Domestic Product (GDP) as illustrated in Figure 1.

Figure 1- Accelerated evolution of Banks and growth from 1990 to 2021



Source: Author

Figure 1 shows that there is a positive relationship between GDP and bank services represented here by broad money in Sub-Saharan Africa. However, the latter correlation does not imply causality between both variables since we are unable to lend support to the demand-following hypothesis where economic growth is expected to cause bank services.

4.1.2. Presentation of Explanatory and Explained Variables

Table 3- Presentation of Variables

Variables	Definitions	Sources
Broad money	It's the amount of currency outside the bank; demand deposits other than those of the central government.	IMF (2022)
GDP	In constant local currency, the annual growth rate of GDP at market prices. It shall be calculated by taking into account no depreciation of production assets or deduction for depletion and deterioration in natural resources.	WDI (2022)
Deposit interest rate	Deposit interest rate is the rate paid by commercial or similar banks for demand, time, or savings deposits. The terms and conditions associated with these tariffs vary from country to country	WDI (2022)
Exportations	The value of all goods and other market services provided to the rest of the world is determined by exports of goods and services.	
Investment	The gross fixed capital formation consists of land improvements, the purchase of machinery and equipment, road construction, etc., in addition to schools, offices, hospitals, private dwellings as well as buildings for businesses and industry.	WDI, OECD (2022)

Source: Author

4.1.3. Descriptive statistics

Table 4- Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	1,024	1.167	3.852	-10.685	9.245
Broad money	1,024	48.181	40.984	-20.903	181.605
Deposit interest rate	1,024	4.979	3.234	.669	13.75
Exports of D&S	1,024	26.459	18.486	-1	91.22
Investment	1,024	17.797	13.244	-10.427	49.161
RNB	1,024	-1.093	6.181	-3.497	45.762

Source: Author

Table 4 presents the descriptive analysis of data used in this paper. The mean and the standard deviation of variables employed in this paper indicate two main inferences. Firstly, the dependent variable, the growth rate (GDP), is the second most stable variable in our model. This means that the GDP would be relatively clustered around the average of 1.167. Secondly, Broad money seems to be the most unstable variable in our model, which may be due to structural changes faced by African countries which consequently render the demand for money unsteady and make monetary policy implementation difficult.

4.2. Methodology

4.2.1. Specification of the Economic Growth Model

Sung & Urrutia (1995) derived models of causality from stock prices to dividends and vice versa based on, the present value model (PVM) and Lintner´s (1956) dividend model (LDM). The panel vector error correction approach utilised in this paper to test the causality between economic growth and banks in a panel of African countries is the modified version of the abovementioned Sung and Urrutia (1995) illustrated below:

The following formula describes a mature corporation's dividend pay-out:

$$D_t = k + PAC(TD_t - D_{t-1}) + e_t \quad (1)$$

Where D_t is the dividend at time t, PAC= PAC<1 is a partial adjustment coefficient, TD is target dividend, k is a constant, D_{t-1} is dividend in time period t-1 and e_t the error term.

The present value model (PVM) is given by:

$$P_t = \sum_{i=1}^{\infty} E_t(D_{t+i})/(1+r)^i \quad (2)$$

Where the discount rate is r and the expectations operator at time t is E_t. Sung & Urrutia (1995, p.172-173) contended that since the company earnings, which is a major cause of target dividends appears to follow a geometric random walk, it is rational to shoulder that target dividend also follows a geometric random walk. Sung and Urrutia (1995), therefore, employed the above theoretical model in a panel vector error correction approach to test the causality between the price of dividends and company earnings.

Earlier on in 1987, Campbell and Shiller (1987) carried out a cointegration and tests of the Present Value Models and found a significant cointegration between dividends and stocks. On the basis of the latter results, we modify Sung & Urrutia (1995) and Lintner´s (1956) models to investigate the causal relationship between economic growth and banks in a panel data of African countries. Our model is written as:

$$GDP = f(MD, RD, EX, FDI, Invest, RNB) \quad (3)$$

Where MD is Broad Money representing banks, GDP is the annual rate of the Gross Domestic Product, RD is the Deposit Interest Rate, EX is Exports of Goods and Services, FDI is the Foreign Direct Investment, INVEST is Investment and RNB is the GDP less Exports. We therefore have the following econometrics equation:

$$\Delta LnGDP_{i,t} = \beta_{1t} + \alpha_{1t}\Delta LnDM_{i,t} + \alpha_{2t}\Delta LnDR_{i,t} + \alpha_{3t}\Delta LnExp_{i,t} + \alpha_{4t}\Delta LnInv_{i,t} + \alpha_{5t}\Delta LnRNB_{i,t} + \alpha_{6t}\Delta LnRes_{i,t} \quad (4)$$

4.2.2. Estimation Results and Discussion

The hypothesis tested in this paper is that banks relationship with economic growth is not consistent with the Keynesian and post-Keynesian prior-investment approach in SSA.

In other word we test whether the relationship between banks and economic growth supports the pattern of the demand-following hypothesis.

- *Short Run Causality Tests*

Table 5 below shows that significant Dumitrescu and Hurlin test (2012) coefficients motivate us to derive two main conclusions: Firstly, the causality tested between economic growth and deposit interest rates is bidirectional. In other words, interest rates are responsible for growth and vice versa.

Secondly, the causality between growth and banks is tested under the null hypothesis of non-causality. According to the results presented in Table 5, in the absence of significance of the Zbar statistic, we cannot reject the null hypothesis in the context of the direction of causality which goes from growth to banks. On the contrary, it is the economic growth that encourages an increase in the bank services. In other words, economic growth is responsible for short-term banking activity in Sub-Saharan Africa. Moreover, exports are found to cause growth, growth causes investment and the differential (Y-EX) present a strong significance of the coefficients, which makes it possible to reject the null hypothesis.

Table 5- Dumitrescu and Hurlin causality test

Null Hypothesis	Zbart Stat
Broad money does not Granger-cause GDP	1.311
GDP does not Granger-cause Broad money	3.610***
Deposit interest rate does not Granger-cause GDP	7.909***
GDP does not Granger-cause Deposit interest rate	1.733*
Exports of G&S does not Granger-cause GDP	3.741***
GDP does not Granger-cause Exports of G&S	-0.719
Investment does not Granger-cause GDP	-2.803
GDP does not Granger-cause investment	97.938***
RNB does not Granger-cause GDP	29.618
GDP does not Granger-cause RNB	-3.887***

Source: Author
Note: Significance at 1% level

- *Long Run Causality*

To observe a potential long-term causality between banks and economic growth, we undertake the stationarity and the cointegration tests, as presented below:

- *Stationarity Test*

There are two generations of tests within the panel unit root-testing procedure. The first generation panel unit root tests pioneered by Choi (2001) and Hadri (2000), Pesaran and Shin (2003) based on the cross-sectional independence assumption. The second generation of panel unit root tests pioneered by Pesaran et al. (2013) aims to overcome the shortcoming of cross-sectional dependence in the first-generation tests. In this regard, Bai and Ng (2005) and Harris et al. (2005), contrary to all other tests, do not assume that there is a unit root in the data. The rejection of the cross-sectional independence hypothesis is the main characteristic of the latter category of tests. Werkmann (2013) issues a restriction that must be made on the cross-sectional error independence. Given this restriction, which reveals a good quality of the relationship between the dependent variable and the variable of interest, we apply the second generation tests proposed by Pesaran (2013). This assumes that the autoregressive coefficients vary from one country to another. The augmented Dickey-Fuller inspired model specified for the Im-Pesaran-Shin (IPS) panel unit root test is presented as follows:

$$\Delta X_{i,t} = \alpha_i + \theta_i X_{i,t-1} + \sum_{j=i}^{\theta_i} \gamma_i \, \Delta X_{i,t-j} + \varepsilon_{i,t} \tag{5}$$

Where $X_{i,t}$ (i = 1, 2, N; t = 1, 2, T) is the panel's endogenous variable, and θ_i represents the augmented Dickey-Fuller statistics and $\varepsilon_{i,t}$ is the error term. The following hypotheses have been selected:

$H_0 : \theta_i = 0$ Pour tout i

$H_0 : \theta_i < 0$ Pour tout $i = 1, 2, \dots, N$

$\theta_i = 0$ $i = N_i + 1, N_i + 2, \dots, N$

The IPS statistic is estimated by the relationship:

$$t_{IPS} = \frac{\sqrt{N(\bar{t} - E(\bar{t}))}}{\sqrt{Var(\bar{t})}} \quad (6)$$

- Cointegration Test

For panel data, Pedroni (1999; 2004) proposes a residual-based cointegration test. It introduces a set of statistics in order to arrive at a verification of the null hypothesis in the absence of cointegration with a theoretically stationary panel of the same order. These statistics are applied to a heterogeneous panel (Neal, 2014).

The results in Table 6 show that the IPS unit root test with trend has, at the 1% level, a significant stationarity of the variables. The null hypothesis of a presence of the unit root in the panel is accepted. Thus, we show that the variables are integrated of order 1 and could maintain a long-term relationship.

Table 6- Stationarity and cointegration tests

Im-Pesaran-Shin Unit-root test					
Variables		Variables			
GDP	-17.968***				
Broad money	-18.501***				
Deposit	-16.780***	Investment	-14.810***		
Export	-19.456***	RNB	-18.233***		
Pedroni cointegration test					
Hypothesis		MPP[a]	PP[b]	ADF[c]	Lags
GDP & Broad are cointegrated		-22.785***	-28.002***	-28.766***	3
GDP & Deposit are cointegrated		-21.112***	-27.098***	-26.945***	3
GDP & Export are cointegrated		-20.921***	-26.446***	-27.308***	3
GDP & Invest are cointegrated		-21.837***	-26.293***	-27.487***	2
GDP & RNB are cointégrated		-21.924***	-25.618***	-25.048***	1

Source: Author
Note: Significance at 1% level; a, b and c denote Modified Phillip Perron, Phillip Perron and Augmented Dickey-Fuller respectively

The statistics introduced by Pedroni (1999, 2004) seek to test the null hypothesis of no cointegration to avoid spurious regressions on the potential stationary panel data of the same order. Taking into account the heterogeneity of the panel (Neal, 2014), the statistics of the test consider residuals and are constructed from specific regressions.

According to Table 6, banks are strongly co-integrated with economic growth and the interest rate on deposits, which predicts a long-term relationship between these two variables. This cointegration, which augurs a long-term causality, is verified through a panel vector error correction model (PVECM)

$$\Delta LnGDP_{i,t} = \beta_{1t} + \alpha_{1t}\Delta LnDM_{i,t} + \alpha_{2t}\Delta LnDR_{i,t} + \alpha_{3t}\Delta LnExp_{i,t} + \alpha_{4t}\Delta LnInv_{i,t} + \alpha_{5t}\Delta LnRNB_{i,t} + \alpha_{6t}\Delta LnRes_{i,t} \quad (7)$$

To test the significance of Equation 7, we undertake three different types of regressions. In the first model, we use the Fixed Effect Ordinary Least Squares (FE-OLS) method. This assumes a heterogeneous structure of the sample considered, which can be captured by an individual effect process (Mátyás and Sevestre, 2008). Under these conditions, if there is a correlation between the error terms, Mátyás and Sevestre (2008) recommend the use of the fixed-effect model, otherwise a random-effect model. The appendix shows the Hausman test of the choice between a fixed-effect model and a random-effect model. The results therefore reveal that the fixed-effect model is preferable to the random-effect model.

Equation 7 is estimated using a different technique, the Mean Group Method (MG). With the fixed-effect OLS technique, the slopes are assumed to be homogeneous, a fairly rigid assumption (Pesaran and Smith 1995; Smith et al. 1999; Phillips and Moon 2000). The relaxation of this constraint relies either on the estimator of clustered means (MG, Pesaran and Smith, 1995), or on the estimator of the pooled mean group (PMG) proposed by Smith et al. (1999). The MG estimator has the advantage of allowing all the coefficients to be heterogeneous (Blackburne and Frank, 2007).

Finally, equation 7 is estimated using the Generalized Method of Moments (GMM) with Engle & Granger (1987) two-step procedure. It should be noted that Costantini and Martini (2010) and Polemis and Fotis (2013) use the latter technique suggested by Blundell and Bond (1998) who argued that the present method is suitable where the number of instruments is greater than or equal to the sample size N. Sargan poses conditions for the validity of the instruments through the test which renders the estimators unbiased.

Considering the sensitivity of GMMs to the validity of the instruments, we regress the model using the dependent variable as instruments, while making a restriction on the lags at 4 until the validation of the null hypothesis of the Sargan test and the number of instruments is adequate. The robustness test of Windmeijer (2005) is also applied in the present method.

Table 7- PVECM results on long-term causality between banks and growth

Variables	Expected sign	FE-OLS	MG	GMM
ΔLnBroad	+	0.260**	0.065***	0.269***
		(0.103)	(3.830)	(0.098)
ΔLnDeposit	-	-0.378**	-0.081***	-2.259***
		(0.176)	(6.200)	(0.817)
ΔLnExports	+	-0.307*	0.142***	3.307***
		(0.165)	(8.910)	(1.214)
ΔLnInvestment	+	0.178*	0.340***	-0.151
		(0.096)	(9.850)	(0.117)
ΔLnRNB	+	-0.079	0.207***	0.586***
		(0.081)	(2.630)	(0.208)
ΔLnResidu	-	-0.891***	-1.000***	-2.370***
		(0.089)	(5.051)	(0.548)
Constant		1.383	-0.749***	-5.719*
		(0.850)	(3.258)	(2.975)
R-squared		0.883		
AR(1)				-0.65**
Sargan test				0.833
Wald test			0.580**	239.18***
Obs.		1,021	940	1,021
Sigma		0.681		

Source: Author

Table 8- Summary of long-term causalities

Causality Direction			Decision
Broad money	→	GDP	Yes
Deposit interest rate	→	GDP	Yes
Export G & S	→	GDP	Yes
Investment	→	GDP	Yes
RNB	→	GDP	Yes

Source: Author

According to the results of model (7) regressed by the methods of FE-OLS, MG and GMM, the sign of the coefficient which designates banks is positive and significant at 5% and at 1%. According to these results, any increase in economic growth of one percentage point, all other things remaining equal, is accompanied by increases of 0.260%, 0.065 and 0.269 in the growth rate of the demand for bank services according to the FE-OLS, MG and GMM respectively. Furthermore, a significant negative interest rate in Table 7 also supports the Keynesian and post-Keynesian prior-investment approach since it will facilitate credit demand which will then be invested and consequently stimulate growth. In other words, economic growth precedes financial development, justified by post-Keynesian theory supported by the demand-following hypothesis. This theory states that economic growth must be stimulated in order to develop banks. That is to say, economic growth comes before financial development. This result confirms the empirical literature. Under the null hypothesis of no short-run effects or short-run causation of growth causation on banks, the Wald test statistics in Model 7 are rejected for all estimated models. Indeed, the Wald test in model 7 reveals that the null hypothesis of no adjustment to the long-term relationship is rejected regardless of the estimation method used. This implies that banks adjust to the economic growth, on average, to the long-term relationship, and according to a process of gearing, make it possible to impulse economic growth.

However, statistically, according to the results of model (7) regressed by the FE-OLS, MG and GMM method, the signs of the coefficients which designate the interest rates on deposits are globally negative and significant at 1%. This states in economic analysis that interest rates must be lowered to stimulate investment and economic growth according to prior-investment approach.

5. Conclusion

The aim of this paper was to review and test Keynesian and post-Keynesian theoretical models on banks and their extensions. The importance of the role of banks in the financial system of SSA is the main reasons for their consideration in our investigation. The literature review has indicated that Post-Keynesian models on banks is an economic paradigm that stems from the work of Keynesian economists such as Keynes and Kalecki. The latter paradigm is defined as the principle of effective demand as developed by Keynes (1936) and Kalecki (1939) which holds in the short and in the long run. That is, that economic

activity in a capitalist monetary economy is demand and not, supply driven as argued by Classical and Neoclassical economists. Therefore, banks should maintain low interest rates to create credit money which will boost investment expenditures and economic growth. A credit-investment-income circuit is thereby established and investment demand generates corresponding saving. More importantly, while existing financial development research has produced little insights into the significant relationship between banks and economic growth in SSA, not much has yet been revealed with respect to the Keynesian and post-Keynesian demand-following hypothesis. Based on the case of banks and economic growth in 20 SSA countries for the 1990-2021, we employ the significant Dumitrescu and Hurlin test (2012) coefficients to find that the short run causality between economic growth and deposit interest rates is bidirectional. While, the short run causality from economics to banks is unidirectional. In the long run, we utilise the methods of FE-OLS, MG and GMM to estimate a causal unidirection from economic growth to banks and from a negative interest rate to economic growth. In other words, economic growth precedes financial development, justified by Keynesian and post-Keynesian demand-following hypothesis.

On the basis of the results above, we argue that policies influencing economic growth can conveniently be designed to affect banks. Therefore, in the short and long terms, economic growth has to be stimulated by factors other than banks since growth is generated by entrepreneurs before any lending because no bank will lend without referring to the historical performance of the company which should show a strong sign of current or expected profits. The latter profits are equivalent to economic growth per company which will create a demand for financial services leading to financial system development. Furthermore, low rather than liberalized interest rate should be encouraged in Africa to stimulate investment, economic growth and consequently savings.

To examine to what extent the results obtained for Sub-Saharan Africa can be generalised to other developing economies, further econometric analysis on various developing countries needs to be conducted. Such an extension could yield important policy implications not captured here. While this paper does not represent the final word on Keynesian and post-Keynesian models on banks, the present study provides some important insights into the process, many of which may be immediately useful to financial development economists. A still better understanding of these issues would be highly input into the decision-making process of government and assistance agencies.

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