

A TEST OF DEMAND-FOLLOWING HYPOTHESIS IN NIGERIAN FINANCIAL SECTOR

Anthony Olugbenga Adaramola

tonylen99@gmail.com

Ekiti State University, Ado-Ekiti, Ekiti State Nigeria

Adebayo Olagunju

olagunju_a@uniosun.edu.ng

Osun State University, Oshogbo, Nigeria

Ayodele Damilola Ogunlokun*

ayodeleogunlokun@gmail.com

Osun State University, Oshogbo, Nigeria

ABSTRACT

The study tested the relevance of Demand-following hypothesis in the Nigerian financial sector using time series data were obtained over a period of 36 years from 1986 to 2021. The study modelled credit provision in the financial sector as a linear function of the three components of the real sector of the economy with interest rate as a control variable. Data were collected from the apex Bank's Statistical Bulletin and analyzed by Autoregressive Distributed Lags after cointegrated relation was detected among the variables. Finding from the study unfolded evidence of weak and positive effect relationship between industrial sector, services sector and credit provision by the financial sector; on the other hand, a negligible negative effect was documented between the agricultural output and the provision of credit by the financial sector. Although evidence of weak causation was discovered between the growth of real sector and the financial sector; however, the causality test result showed further that it is the financial sector caused growth of the real and not vice versa as stated in the Demand-following hypothesis. Based on this finding, the study concluded that relationship between the real sector's growth and the financial sector's growth is more of effect than causal while the Demand-following hypothesis does not hold true in the context of the Nigerian financial sector. Consequently, the study recommended of the action-based state of emergency in the real sector so as to rapidly address some of the infrastructural challenges impeding the growth of the sector from observing Demand-following hypothesis.

Keywords: Causality; Credit; Finance; Growth; Real Sector

**Corresponding Author*

ABSTRAK

Penelitian ini menguji relevansi hipotesis *Demand-following* di sektor keuangan Nigeria dengan menggunakan data deret waktu selama 36 tahun, dari tahun 1986-2021. Penelitian ini memodelkan penyediaan kredit di sektor keuangan sebagai fungsi linier dari tiga komponen sektor riil ekonomi dengan suku bunga sebagai variabel kontrol. Data dikumpulkan dari Buletin Statistik Bank Sentral dan dianalisis menggunakan model *Autoregressive Distributed Lags (ARDL)* setelah terdeteksi adanya hubungan kointegrasi antar variabel. Temuan dari penelitian menunjukkan adanya hubungan pengaruh yang lemah dan positif antara sektor industri, sektor jasa, dan penyediaan kredit oleh sektor keuangan; di sisi lain, efek negatif yang sangat kecil tercatat antara output pertanian dan penyediaan kredit oleh sektor keuangan. Meskipun ditemukan bukti adanya kausalitas yang lemah antara pertumbuhan sektor riil dan sektor keuangan, hasil uji kausalitas menunjukkan lebih lanjut bahwa sektor keuanganlah yang menyebabkan pertumbuhan sektor riil, bukan sebaliknya seperti yang dinyatakan dalam hipotesis *Demand-following*. Berdasarkan temuan ini, penelitian menyimpulkan bahwa hubungan antara pertumbuhan sektor riil dan pertumbuhan sektor keuangan lebih bersifat akibat (*effect*) daripada kausal (*causal*), sehingga hipotesis *Demand-following* tidak berlaku dalam konteks sektor keuangan Nigeria. Oleh karena itu, penelitian merekomendasikan adanya status darurat berbasis aksi di sektor riil untuk secara cepat mengatasi beberapa tantangan infrastruktur yang menghambat pertumbuhan sektor tersebut dalam memenuhi hipotesis *Demand-following*.

Kata Kunci: Kausalitas; Keuangan; Kredit; Pertumbuhan; Sektor Riil



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1. INTRODUCTION

The Nigerian financial sector provides the needed support system for the growth and expansion of an economy and forms the bedrock for stimulating investments across the different sectors of the economy. This pivotal role is played in the form of making necessary supply of financial resources that are required to facilitate productive investments; such financial resources are mobilized from sector(s) of less need to other areas of high demand for onward efficient allocation to means of production and distribution of goods and services, ultimately to stimulate growth in the aggregate economy. One of the critical factors of production is capital, which is a stimulant for production and other forms of investments that help to promote economic growth, and without which no investments, no matter how commercially or economically viable they are can be executed. Hence, through accumulation and allocation channels, financial sector affects economic growth; the accumulation channel deals with mobilization of savings deposit to form a pool of fund that can be lent for productive investment, while allocation channel connotes the observance of efficiency in the allocation of accumulated pool of funds for productive investments.

Supporting the above position, Mamman & Hashim, (2013) argued that because the real sector is a critical economic component through which physical products and services needed to meet demand aggregate are produced and distributed, proper credit flow from the banking industry to the real sector is essential. In addition, Eburajolo & Aisien, (2019) argued that the potential for growth of credit granted by banks to the agricultural and manufacturing sectors is substantially boosted by the development of the nation's financial sector, while adding that both in the short and long terms, developing the financial sector is positive and significant in terms of effect on economic growth in Nigeria.

Because of the sustained finance flows to the various productive sectors of the economy from the financial sector, Joseph Schumpeter laid the theoretical foundation for finance-growth relationship in 1911 when he postulated that supply of finance by the financial agents within the liberalized financial sector helps to finance entrepreneurial opportunities and technological innovations capable of stimulating economic growth ultimately. This postulation has been subjected to empirical tests over the decades and findings are divided on whether finance actually promotes economic growth or it is the economic growth that actually spurs financial sector's growth. For instance, hierophants like McKinnon, (1973), Shaw, (1973), Harvey, (1993), Levine, (1997) and others, including Fry, (1995) all concur with Joseph's position, sequel to their studies that finance supply spurs growth. On the contrary, authors like Robinson, (1952), cited in (Guru & Yadav, 2019) and (Lucas Jr, 1988) submitted that less role is played by finance in promoting economic growth; instead, it is the growth that drives finance is the chief among this group.

Following these divergent views on the connection betwixt finance and economic growth, Patrick, (1966) developed four hypotheses namely: the supply-leading hypothesis, which is based on the idea that growth and finance are causally related; Demand-following hypothesis, which means that economic growth promotes the growth of the financial sector. For instance, in a strong economy, the private sector would desire additional financing tools and easier access to foreign funds; hence, financial activities merely increase in accordance with overall economic development (Robinson, 1952). Furthermore, the "Feedback-hypothesis" postulates that finance and growth may be mutually dependent, with the real sector providing the funding necessary for financial development and eventually opening the door for capitalizing on financial economies of scale, which then promotes economic development (Berthelemy & Varoudakis, 1996). The "Neutrality hypothesis," the fourth theory, contends that there is no connection between finance and economic expansion. However, the literature demonstrates that the vast majority of existing studies solely investigated and aligned with the Supply-leading Hypothesis, with few investigations on the empirical confirmation of the Demand-following Hypothesis.

Granted therefore that according to Patrick, (1966), the volatility of financial development and finance-led growth depends on a country's developmental stage; growth is greatly impacted at the beginning of a country's development, but this relationship weakens when true growth is achieved because demand for banking services has been made possible by growth. It is expected that real sector, which is financed through the operators in financial sector supposed to affect the growth of the sector somehow. Consequently, the concern of the present study therefore is to subject Demand-following Hypothesis to test in the context

of Nigerian financial sector so as to reveal where lies the bearing of the causality betwixt this sector and the Nigerian real sector economy.

The real sector of the economy according to CBN classification includes Agriculture, Industry and Service sub-sectors Finance is necessary for investment in agriculture; whether in commercial or subsistence farming, money is needed to buy seeds, fertilizer, farm equipment, agrochemicals, etc. Also, the industrial and service sectors depend on the financial sector for the supply of finance for various factors of productions – land, labour and capital. This implies that the financial sector depends on the real sector, which acts as a propeller of the economic growth, for its life; conversely, the financial industry depends on the tangible sector for funding in order to survive. However, the direction of empirical studies currently focuses substantially on the effect of finance on economic growth, either aggregated or disaggregated as reflected in the studies of Egbulonu & Nwokoro, (2016), Ademola, (2019), Bada, (2017), Zakaria & Bibi, (2019), Jirbo *et al.*, (2020), Eburajolo & Aisien, (2019), Onuh *et al.*, (2022) without extensive research on how economic growth, particularly in the real sector, affects the financial sector. The core of the Demand-following hypothesis is that there is an empirical gap on the cause-and-effect relationship between the real sector and the financial sector. However, existing research have not examined the causation between the disaggregate real sector and the financial sector. Although Magaji *et al.*, (2021), Ozigbu, (2018), Isu *et al.*, (2013) evaluated the causation betwixt finance and growth in their respective studies; however, their focus was on how finance affect growth and not the other way round as intended by the present study; also, these studies only made use of aggregate GDP to proxy economic growth but the present study disaggregated the economy into the three main component that make up the real sector for proper sectoral effects and cause analysis. Therefore, unless this causality effect is empirically investigated, debate in the literature may remain skewed in favour of Supply-leading Hypothesis and evidence corroborating Demand-following Hypothesis may remain scanty and substantially unjustified.

Therefore, the study poses the following question in filling the gap identified: How does the growth of the real sector affect credit expansion in the Nigerian financial sector? Is there a causation between the growth of the real sector and the credit expansion in the Nigerian financial sector? What is the direction of causality between the growth of the real sector and the credit expansion in the Nigerian financial sector? To answer the foregoing questions, the study's data collection and analysis covered a period of 36 years from 1986 being the beginning of liberalization of the financial sector to pave way for efficient allocation of financial resources to the real sector to 2021, based on data availability. Liberalization enables the cost of credit supply to be determined by the forces of market demand and supply, thereby giving way to efficient allocation of credit to the most productive sector unlike the direct allocation of credit which has hitherto impeded productive development.

2. LITERATURE REVIEW

Conceptual Review

Overview of the Finance and Financial Sector

As per Chechet & Olayiwola, (2014), the process of exchanging money for products, services, or assurances of future profits it's a primary activity from the realm of finance. With deeper insights, finance includes the group of organizations that constitutes the financial landscape of an economy and carry out crucial economic tasks like attracting savings, ensuring allocation of capital efficiently, especially to finance profitable business ventures, monitoring managers to make sure the funds meant for business investments are used as intended, and converting risk, that is, lowering risk and permits those ready to bear them by means of. Before it can result in economic growth in the context of finance' relationship with growth, the financial sub-sector is expected to increase investments and savings. Five key tasks must be carried out by the system: mobilize and pool assets; oversee investments and practice corporate governance after disbursing funds; and encourage trading, diversification, and risk management. It is necessary for it to allocate money, produce ex ante data on prospective investments, and ease the trading in goods, including services.

Nigeria's financial sector consists of the financial markets and the financial institutions, which are further divided into bank and non-bank institutions. These institutions have different core mandates, but they typically connect when it comes to mobilizing savings and funds from areas with surplus to places of deficit for effective use. Hence, according to Kalu, (2009), units with surpluses and deficits make up the typical capitalist or mixed economy. In order to carry out their basic role of intermediation, banks mobilize deposits from different economy's surplus sectors, and from these deposits them as loans and advances to the sector that is in deficit. Sanusi, (2012) agreed with the aforementioned point of view, arguing that it is dangerous to assume that the financial system plays a passive role in raising money and directing it to the real sectors of the economy.

Additionally, it is stated in the submissions of Galac, (2001) and Honohan, (1997) that business activity will not increase if lenders have no ability to grant loans to deficit unit within the economy in their immediate business environment, while deposits will be constrained, limiting banks' ability to produce income and, as a result, their own growth. As a result, Pagano, (1993) and Levine, (1997) contend that growth in the financial sector is regarded as the primary input for economic growth and an important component that influences growth through modifications in productivity increases and capital efficiency. Through modifying the share of savings and the savings rate, it enhances the capital accumulation. Because of this, loanable funds account for 50% or more of most banks' total assets and between 50% and 66% of their earnings (Onwude et al., 2018). As a result, banks' main and most significant function became lending. For a number of reasons, this role is crucial. First, consumers or customers assess the financial stability of banks based on their loan portfolios. Banks that are eager to lend are regarded as being less volatile than those that typically turn down their clients' loan requests (Mamman & Hashim, 2014).

Otto *et al.*, (2012) suggest that the financial sector provides the following services in exchange for which they obtain equivalent salaries to emphasize the role of the financial sector in supporting growth in the real sector of the economy:

- i. Savings role: The financial system acts as a channel to facilitate savings by the public. Financial assets that are offered in the financial markets offer a beneficial outlet with comparatively very low risk spenders in the surplus units. This then allow them to flow I to investment through the financial markets channel, by allowing a greater number of products and services to be created, hence boosting societal welfare. When savings flows decrease, so do investment and quality of life.
- ii. Payment role: This connotes that means for making payments for products and services are equally provided by the financial system. Certain financial assets act as an exchange vehicle to facilitate payments. Credit unions and banks' credit cards including the ones provided by other financial institutions are also commonly recognized as a mode of payment that are convenient.
- iii. Risk protection role: Clients of the securities markets are protected from risks to their health, life, property, and other assets. Offering insurance contracts is how this is done.
The cash raised from the sale of insurance also serve to stimulate activity in Nigeria's money and financial markets.
- iv. Liquidity role: The financial sector provides a mechanism of transforming wealth stored in financial securities into liquid cash with insignificant risk of value loss.
- v. Credit role: Financial markets offer loans to finance investment and consumption spending, as well as liquidity and assistance with the conversion of savings into investments to create wealth. Loaning money on credit involves promising to pay back the money in the future. In order to buy basic needs, homes, fix malfunctioning cars, and pay off unpaid debts, consumers need credit.

To further strengthened the Nigerian financial sector towards delivering on its mandate to support critical sectors of the economy The National Development Plan (NDP) budget objectives for 2021-2025 have been adopted. According to Enugwu *et al.*, (2022), the goal of this Plan is to enhance liquidity levels in every component of the financial sub-sector in such a way that will sustain growth and development in Nigeria. It is to effectively enhance all aspects of the Nation's balance sheet in order to make the required liquidity available to sustain the economy's prosperity, expansion, and transformation. The preceding supports Magaji *et al.*, (2023) conclusion that banks ensures that the quantum of credit supplied to the economy is increased, and the effect of this action should be observable both qualitatively and quantitatively on the real sector, all of which should culminate in an increase in job creation and output in the economy would increase the mobilized savings deposit as more labour is employed with wage and salary income, while output expansion would enhance requests for financial resources from the real sector. There is therefore, the need to provide empirical evidence for growth-finance relationship in the context of Nigerian financial sector as aimed by this study as this represents a significant departure from the exiting studies, the preponderance of which focus on supply-leading hypothesis.

The Demand-following Hypothesis proposes that there is a linkage betwixt the real and financial sub-sector, stating that economic progress spurs demand for financial services, resulting in the financial sector's development. Hence, empirical investigations have shown that the contemporary economy is a credit-driven economy. Thus, based on these premises,

every sector of the economy need credit for a variety of reasons, including characteristics that improve the quality of outputs or the efficiency with which inputs are translated into outputs (Esowe, 2020).

It is thus clear from the foregoing that CBN normally encourages lending to the real sector (mainly Agriculture, Industry and service sectors) because the output of these sectors, and by extension, their capacity to drive economic growth depends largely on the efficient allocation of credits to them by the financial sector. In return for these several billion naira of credits, interest incomes accrue to the financial sector and increase in the output of the real sectors pave way for expansion in investment and employment opportunities as more labour would be employed thereby that leading to further borrowings and savings deposits from and to the financial sector. This thus justifies the need for demand following hypothesis to be tested in the context of the Nigerian financial sector so as to understand how financial sector relates to the real sector in terms of cause-and-effect relationship.

Theoretical Framework

Demand-following Hypothesis

The Demand-Following hypothesis, put forth by Patrick, (1966), serves as the foundation for this study and contends that changes in the real sector have an impact on financial development (i.e., the expansion of the financial sector). According to the Keynesian hypothesis of financial deepening, rising government spending is to blame for the phenomenon. The government should increase government spending so as to promote growth in the economy and achieve full employment. The demand for money rises as government spending boosts overall demand and income (McKinnon, 1973). According to Robinson, (1952), the financial sector's demand is driven by the need created by the economy's rapid expansion. Accordingly, this viewpoint holds that economic expansion is what drives up demand for money use, which in turn promotes the rise of the financial industry. Put another way, as the real estate industry expands, so does the need for the services provided by the financial markets. Therefore, the assumption of this theory is that the demand for financial services increases in tandem with economic growth, as confirmed by Goldsmith, (1969), Lucas Jr, (1988), Ndlovu, (2013), D. G. Omotor, (2007), and Robinson, (1952).

This is the causal relationship between the growth of the financial sector and economic expansion. The aforementioned demonstrates that the real sector, a significant component of the overall economy, has the ability to impact the growth of the financial sector because the Demand-following Hypothesis postulates that as the real sector grows, the demand for financial services will increase as a result, which in turn drives growth in the financial sector. This remains the view advocated by Robinson, (1952) and tagged financial development is next to economic growth, in such a way that as the economic flourishes, growth in finance emerges. This is further cemented by the Feedback Hypotheses which expostulates that a mutual effect exists between the development of the financial sector and economic growth according to Apergis *et al.*, (2007). This study is thus underpinned by the Demand-following hypothesis.

Empirical Review

Eburajolo & Aisien, (2019) evaluated the impact of commercial bank loans to Nigeria's manufacturing and agriculture subsectors on economic growth using time series

data from 1981 to 2015. For the empirical study, they employed error correction and co-integration techniques. According to the study, Nigeria's economic growth is significantly impacted both immediately and over time by the availability of commercial bank loans to the manufacturing and agriculture sectors. The growth effects of commercial banks' credit to the economy's manufacturing and agriculture sectors are further amplified by the financial sector's expansion. The implementation of a purposeful strategy by Nigeria's top financial authorities to compel banks to lend money to specific economic sectors was then recommended. However, this study did not look at how the manufacturing and agricultural sectors impact the growth and development of the financial sector, nor did it include the service sector in its analysis. Thus, the current study looked at how the real sector influences and causes the financial sector's growth. Financing provided by commercial banks to the economy's manufacturing and agriculture sectors.

Onuh *et al.*, (2022) assessed the effect of financial intermediation by Deposit Money Banks on the growth of Nigeria's real economy using the Vector Error Correction model, with the real GDP growth rate as the dependent variable and the inflation rate, average industrial capacity utilization, and private sector credits as the variables that are autonomous. The study's conclusions indicate that lending to the private sector in Nigeria has a significantly positive effect on actual sector growth, and that average utilization of manufacturing capacities and inflation rate have a significant impact on Nigeria's real sector growth. Even though this study concentrated on the real sector, it did not perform the causality test as the current study did; instead, its goal was to validate the Supply-leading Hypothesis, whereas the current study focuses on the Demand-following Hypothesis and investigates the impact of the real sector on the growth of the financial sector.

Magaji *et al.*, (2023) examined how bank loans affected Nigeria's real estate market using the Auto Regressive Distributed Lagged model. The results demonstrate that both short-term and long-term commercial bank loans increase Nigeria's GDP. The real sector and domestic private investment were found to have a negative long-term relationship. The presented econometric model's predicted long and short run equation indicates a strong positive correlation between government capital expenditures and the real sector. A major increase in domestic private investment, commercial bank loan, and government capital spending resulted in a large increase in RGDP in the near future. The findings demonstrate that the real sector's use of bank credits is necessary to maintain Nigeria's economic progress. Again, this study was conceived to test SL hypothesis and not DF hypothesis which the focus of the present study. In addition, the study did not bother to examine the direction of causality between the banking sector and the real sector; equally, the study narrowed itself down to the banking sector unlike the present study carried causality test between the real sector and the entire financial sector.

Akintola *et al.*, (2020) examined the independent effect of the money, capital, and foreign exchange markets on economic growth in Nigeria by making use of data obtained quarterly from 2000 to 2019 to analyse the influence of financial sector expansion on economic growth. The findings demonstrated that over the long run, financial deepening, banking system liquidity, and the all-share index had a favourable and strong impact on the growth of output in real terms. In order to stimulate economic growth, macroeconomic

managers in Nigeria were instructed to give priority to the expansion of the money and capital markets. This study failed to carry out causality test between finance and economic growth as intended by the present study. Also, the study aimed at confirming supply leading hypothesis with no consideration for Demand-following Hypothesis.

In order to estimate panel data and evaluate the effects of financial inclusion on the output of agriculture in Nigeria, both inferential and descriptive statistics were used by Fowowe, (2020). The findings suggested that in order to further enhance agricultural output in Nigeria, efforts to attract more families should be intensified, as financial inclusion had a positive and noteworthy influence on it across all metrics used to quantify it. The present study tested the demand-following theory and examined the impact of real sector growth on the financial sector.

Jirbo *et al.*, (2020) acquired and evaluated annual time series data between 1986 and 2019 so as to ascertain the impacts of agriculture and economic growth on Nigeria's manufacturing sector. The study discovered that output of agriculture, spending by government on agriculture, and real gross domestic product had a favorable impact on the sector that manufactures after analyzing data from the CBN's Bulletin and the Nigerian Statistical Bureau. The Nigerian government was therefore recommended to allocate more resources to the agriculture sector, which should be closely monitored to ensure appropriate use, while also making further efforts to encourage the manufacturing sector to foster expansion. This study did not carry out test of causality to reveal the what causality looks like among its variables and neither did it consider the three components of real sector as done by the present study but narrowed its scope down to agriculture which is just a component of the real sector.

In order to evaluate the effect of financial growth on agricultural output in South Asia, Muhammad Zakaria *et al.*, (2019) gathered and examined data from 1973 to 2015 using a cointegration approach. They found that productivity of agriculture initially increased as financial advancement increased but then declined after a certain threshold, and that increases in physical and human capital, as well as openness and income level, were strongly associated with agricultural production, while terms of trade had a negative effect on agricultural output. Again, the focus of this study was on just a component within the real sector focused on in this study it only focused on agriculture and also failed to carry out causality test as done by the present study

Ademola, (2019) looked into how real sector finance affected Nigeria's economic expansion. The study gathered and assessed secondary source data using the Ordinary Least Square approach. The calculated model indicates that Nigeria's economic growth was negatively and marginally impacted by the combination of agricultural credits and agricultural productivity. In order to achieve agriculture that is pro-economic growth, the study suggested that reliable macroeconomic policies be implemented to promote debt-equity and investment in the agricultural sector. The output of agriculture was negatively impacted by commerce. This study did not reveal the direction of causality between agriculture and finance and tested only the Supply-leading Hypothesis unlike the present study.

Bada, (2017) examined the influence of agricultural and industry productions on the Nigeria's economy over a 31-year period from 1984 to 2014. This study gathered annual data

from the Nigerian Statistical Bureau and the CBN's Statistical Bulletin. The data were analyzed using Vector Auto-regressive models, and outcomes showed that bank credits have a major impact on Nigeria's agricultural and manufacturing sectors. As a result, it was proposed that the government provide more funding to the Nigerian economy's real sector in order to increase their contributions to economic expansion and reduce unemployment. Although, this study focused on two of the three components of the real sector, it did not examine them on the financial sector growth like present study did, while no causality test was carried out by the study in like manner of the present study.

Owonifari & Larinde, (2020) used qualitative as well as quantitative techniques to evaluate the role of agriculture in Nigeria's economic recovery and growth. Despite the fact that many people view agriculture as a means of subsistence and one of their main sources of income, the results showed that it was far from promoting the growth of the economy. As a result, the report advised that agriculture be given the same amount of attention as the oil industry in order for agriculture to fill its proper place in the Nigerian economy. This study however, focused on agriculture alone with no consideration for other real sub-sectors which are considered by the present study. In addition, the study was not meant to test demand - following Hypothesis and neither did it carry out causality test.

3. RESEARCH METHOD

Research Design

The current study's design is quantitative in nature, and as a result, it collected and assessed empirical data in an effort to test the Demand-following Hypothesis in the Nigerian financial sub-sector.

Model Specification

The Demand-following Hypothesis, put forth by Patrick, (1966), asserts that the financial sector's growth depends on the expansion of the overall economy. This hypothesis serves as the foundation for the model that describes the link between the study's variables. Hence, the present study adapted following model specified by Eburajolo & Aisien, (2019) after modification as follows:

$$CPS = f(AGOUT, INDOUT, SEOUT, LINT).....(2)$$

The independent variables i.e. AGOUT, INDOUT and SEOUT are selected because they are the three subcomponents of the real sector according to CBN's classification.

Eq(2) is transformed into stochastic model thus:

$$CPS = \beta_0 + \beta_1AGOUT + \beta_2AINDOUT + \beta_3SEOUT + \beta_4LINT + Ut.....(3)$$

Taking logarithm, Eq(3) can be expressed as:

$$CPS = \beta_0 + \beta_1\lnAGOUT + \beta_2\lnINDOUT + \beta_3\lnSEOUT + \beta_4LINT + Ut.....(4)$$

The ARDL model form of (4) is stated thus:

$$\Delta\ln CPS_t = \beta_0i + \beta_1\lnAGOUT_{t-1} + \beta_2\lnINDOUT_{t-1} + \beta_3SEOUT_{t-1} + \beta_4LINT_{t-1} + \sum_{i=1}^p \theta_i\Delta\ln CPS_{t-1} + 1 + \sum_{i=1}^q \gamma_i\Delta\lnAGOUT_{t-1} + \sum_{i=1}^q \lambda_i\Delta\lnINDOUT_{t-1} + \sum_{i=1}^q \phi_i\Delta\lnSEOUT_{t-1} + \sum_{i=1}^q \delta_i\Delta\lnLINT + \Psi ECM_{t-1} + Ut.....(5)$$

Where:

CPS: aggregate credit as supplied by the financial sector to private sector for investment,

AGOUT: Aggregate output of the agricultural sector, measured by the real GDP of the sector
 INDOUT: Aggregate output of the industrial sector, measured by the real GDP of the sector;
 SEOUT: Aggregate output of services sector, measured by the real GDP of the sector
 LNTR: average lending interest rate in Nigeria;
 $\beta_1 - \beta_4$: These are the parameters to be estimated;
 β_0 : Regression constant
 $\gamma_i, \lambda_i, \phi_i, \delta_i$ = The short run coefficients or multipliers.
 p = lag order of the dependent variable
 q = lag order of the independent variable
 ΨECM_{t-1} = When there is a deviation, this is the coefficient that quantifies the rate of adjustment to equilibrium by lnCPS is used; it is anticipated that this coefficient will be statistically significant and negatively skewed.

A priori Expectation

Connecting the specified model with Demand-Following Hypothesis, the real sector outputs should positively influence financial sector growth as denoted by following:

AGOUT > 0, INDOUT > 0, SEOUT > 0, LNTR > / < 0

Sources of Data

Data were obtained from the Bulletin of statistics issued by the Central Bank of Nigeria for a 36-year period starting in 1986, when the financial sector first began to liberalize in order to make way for an allocation of financial resources effectively to the real sector, and ending in 2021, subject to data availability.

Estimation Technique

Autoregressive Distributed Lags Models were selected as the appropriate estimate method for the study after the stationarity test, which was carried out using the Philips-Perron (1988) approach, showed that the research variables were integrated of distinct order I(0) and order I(1) (Phillips & Perron, 1988).

4. RESULTS AND DISCUSSION

Descriptive Statistics

To be able to describe the characteristics of the data set of the study, the study obtained descriptive analysis in respect of the data set and Table 1 shows summary of these characteristics.

Table 1. Summary of Descriptive Statistics

| | CPS | AGOUT | INDOUT | SEOUT | LINT |
|-----------|----------|----------|----------|----------|----------|
| Mean | 7482,410 | 9310,142 | 12597,85 | 18622,18 | 18,33208 |
| Median | 1259,100 | 8626,703 | 12951,53 | 12637,52 | 17,76781 |
| Maximum | 32868,49 | 18738,41 | 16742,15 | 38771,49 | 29,80000 |
| Minimum | 15,24745 | 2891,672 | 834,534 | 5673,405 | 10,50000 |
| Std. Dev. | 903,177 | 5590,610 | 2383,684 | 12323,77 | 3,927856 |
| Skewness | 1,109637 | 0,326043 | 0,044256 | 0,489408 | 0,773553 |

| | | | | | |
|--------------|----------|----------|----------|----------|----------|
| Kurtosis | 2,920886 | 1,559689 | 1,769417 | 1,550700 | 4,323720 |
| Jarque-Bera | 7,397152 | 3,749568 | 2,283254 | 4,587831 | 6,218654 |
| Probability | 0,024759 | 0,153388 | 0,319299 | 0,100871 | 0,044631 |
| Sum | 269366,8 | 335165,1 | 453522,5 | 670398,5 | 659,9548 |
| Sum Sq. Dev. | 3,43E+09 | 1,09E+09 | 1,99E+08 | 5,32E+09 | 539,9819 |
| Observations | 36 | 36 | 36 | 36 | 36 |

Source: Author's computation using E-view 10. 0 (2023)

Table 1 reveals that growth in the services sector (SEOOUT) has the highest average value of 18.622,18; this is followed by growth in the industrial sector (INDOUT) with 12.597,85 average value; growth in the agricultural sector (AGOUT) occupies third position with 9.310,14 average value while with 1.393,44, gross credit by the financial sector (CPS) occupies the fourth position; and the lowest mean value is recorded by lending interest rate at 18,33. The mean values are also lying within the lowest and highest range values, implying absence of any outlier in the estimates; the recorded median values equally follow the mean trend in terms of magnitude. Furthermore, the standardized deviations the average values by the sets of the observations are also within the tolerable levels excel for AGOUT and SEOOUT with above average standard deviation values.

The skewness results show that all the variables are symmetrical around their average values and normally skewed with 0 values except the CPS which is positively skewed suggesting that its distribution has long right tail and more observations that are higher than the sample mean. With respect to the kurtosis, Table 1 shows a platykurtic trend in the variables as they all recorded kurtosis less than 3, suggesting a negative skewness and flatted curve. The only exception is the LINT which is leptokurtic since it has a value higher than 3, thereby suggesting peaked curve distribution. The Jarque-Bera statistics show that all the variables are normally distribution since their p-values are statistically insignificant at 0,05 level, suggesting the acceptance of the null hypothesis of normal distribution for the data set. The exception in this case is the LINT and CPS with statistically significant p-value, and this connotes that their observations are not normally distributed.

Unit Root Test

Unit roots are typically present in data from time series, which are trended and can lead to erroneous results if not handled carefully. The variables were thus put through a unit root test using the Philips-Perron technique, and the findings are shown in Table 2a & b.

Table 2a. Augmented Dickey-Fuller Unit root test at logarithmic levels
H0: Each variable series contains a unit root; **H1:** H0 is false

| Variables | Critical value @5% | Philips Perron test statistics | Order of Integration | Remarks |
|-----------|-----------------------|-----------------------------------|-------------------------|----------------|
| CPS | -2,998404 | -4,936763 | - | Stationary |
| AGOUT | -2,998404 | -0,431947 | - | Stationary |
| INDOUT | -2,998404 | -1,906289 | - | Non-stationary |

| | | | | |
|-------|-----------|------------|------|------------|
| SEOUT | -2,998404 | -0,906403 | - | Stationary |
| LINTR | -2,998404 | -4,047042* | I(0) | Stationary |

Source: Author's computation using E-view 10.0 (2023)

Table 2b. Phillips-Perron Unit root test results at first differences

| Variables | Critical value @5% | Philips Perron test statistics | Order of Integration | Remarks |
|-----------|-----------------------|-----------------------------------|-------------------------|------------|
| CPS | - | - | I(0) | Stationary |
| AGOUT | -2,951125 | -5,599812* | I(1) | Stationary |
| INDOUT | -2,951125 | -5,538163* | I(1) | Stationary |
| SEOUT | -2,951125 | 3,285746* | I(1) | Stationary |
| LINTR | - | - | I(0) | Stationary |

Source: Author's computation using E-view 10. 0 (2023)

Table 2a shows result obtained when the unit root test was conducted on the variables at logarithm levels. According to the Table, only LINT and CPS series were stationary at levels while the remaining variables (AGOUT, INDOUT and SEOUT) have unit roots in their series. Consequently, these three variables were differenced once in a bid to strip them of their unit roots and the results displayed on Table 2b makes it clear that such variables became stationary at first differencing. The implication of this is that the study's variables are mixed up with order I(0) and I(1) data series. This thus satisfies the main condition for using Autoregressive Distributed Lags (ARDL) model for estimating the specified model for this study sequel to Pesaran *et al.*, (2001).

Cointegration Bound Test

The ARDL cointegrated bond test was used to determine whether a co-integration connection existed between the research variables, and the results are shown in Table 3.

Table 3. Co-integration Bound Test Result

| Test Statistic | Value | Signif. | I(0) | I(1) |
|----------------|----------|---------|------|------|
| F-statistic | 9,464214 | 10% | 2,2 | 3,09 |
| K | 4 | 5% | 2,56 | 3,49 |
| | | 2,5% | 2,88 | 3,87 |
| | | 1% | 3,29 | 4,37 |

Source: Author's computation using E-view 10. 0 (2023)

The null hypothesis, which states that there is no long-term association, could not be accepted because Table 3 shows an F-statistic of 9,46, which is bigger than the lower bound (2,56, 3,29) and upper (3,49, 4,37) critical values at both 95% and 99% confidence intervals. Therefore, the conclusion is that the factors need to be examined for a long-term cointegrated relationship. As a result, long-term coefficients for the model parameters were estimated.

Table 4. Long Run Coefficients and Error Correction Mechanism (ECM)

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|-------|
|----------|-------------|------------|-------------|-------|

| | | | | |
|-----------|-----------|----------|-----------|--------|
| LAGOUT | 0,108266 | 5,045509 | 0,021458 | 0,9842 |
| LINDOUT | -1,107914 | 8,256699 | -0,134184 | 0,9018 |
| LSEOUT | 3,456604 | 6,952837 | 0,497150 | 0,6532 |
| LINT | -0,347122 | 0,194833 | -1,781639 | 0,1728 |
| ECM (-1)* | -0,389974 | 0,031691 | 12,30559 | 0,0012 |
| C | -1,193413 | 50,41350 | -0,236725 | 0,8281 |

*RGDPFS, AGOUT, INDOUT, SEOUT, LINTR are the same as defined previously,

Source: Author's computation using E-view 10. 0 (2023)

The long-term correlation coefficients between the growing amount of credit provision in the financial sector and the growth in the real sector are displayed in Table 4, which also indicates that the activities in these sectors are co-integrated in the long-term in the following linear trends, adhering to the model (5):

$$CPS = -11,9341 + 0,1083*AGOUT - 1,1079*INDOUT + 3,4566*SEOUT - 1,19341*LINTR - 0,3898*ECM$$

According to the co-integration equation above, there is currently a heterogeneous long-term link between the growth of the financial and real sectors. In particular, the formula indicates that a 1% rise in agricultural sector output (AGOUT) led to a roughly 10% increase in financial sector credit (CPS) expansion, and vice versa. However, over time, a 1% increase in industrial sector output (INDOUT) led to a roughly 110% decrease in financial sector loan expansion, and vice versa. In the long term, the service sector was accountable for around 346% of the financial sector's credit expansion for every 1% increase in its output (SEOUT), and vice versa.

Lending interest rate on the other hand was negatively and insignificantly associated with the financial sector's growth to the extent that it triggered about 119% decrease in the credit expansion by the financial sector for every 1% increase in its value and vice versa. Furthermore, the standard errors of the estimates are very low when compared with true values of the variables which are in billions and millions of naira; this thus underscores the reliability of the estimates as very close to their true values. The error correction model (ECM) coefficient is -0.3899 with right sign and statistically significant p-value as revealed by Table 4, suggesting that short run disequilibrium in the model due to shocks on the variables was corrected and the model converged at equilibrium at the speed of 39% approximately. The cointegration association between the real sector's expansion and the expansion of credit in the financial sector is therefore considered sustainable and maintainable at this tempo. The study is most interested in the causality test to actually determine whether the Demand-following hypothesis is applicable in the context of Nigeria, even though the aforementioned results offer helpful insights into the effect relationship between the expansion of credit by the financial sector and the growth of the real sector.

Causality Test

To obtain further evidence to verify the claim of the DF Hypothesis on the ability of the growth in the economy to spur increase in credit demand in the financial sector by the real sector, the study conducted causality test and the result is revealed by Table 5.

Table 5. Pairwise Granger Causality Test

| Null Hypothesis: | Obs | F-Statistic | Prob. |
|-------------------------------------|-----|-------------|--------|
| LAGOUT does not Granger Cause LCPS | 31 | 0,54342 | 0,7413 |
| LCPS does not Granger Cause LAGOUT | | 1,09358 | 0,3944 |
| LINDOUT does not Granger Cause LCPS | 31 | 0,96214 | 0,4640 |
| LCPS does not Granger Cause LINDOUT | | 2,66879 | 0,0527 |
| LSEOUT does not Granger Cause LCPS | 31 | 1,00856 | 0,4384 |
| LCPS does not Granger Cause LSEOUT | | 3,07031 | 0,0324 |
| LINT does not Granger Cause LCPS | 31 | 1,31868 | 0,2962 |
| LCPS does not Granger Cause LINT | | 1,83754 | 0,1511 |

Source: Author's computation using E-view 10. 0 (2023)

Judging by the insignificant of the F-stat, it is clear from Table 5 that there is no causality between the real growth in the agricultural sector (AGOUT) and credit expansion in the financial sector (CPS); this is to say clearly that growth in the agricultural output did not granger cause or lead to financial sector's expansion nor credit expansion by the financial sector caused growth of the agricultural output. Also, the result shows that there is a unidirectional causality between the growth of the industrial sector (INDOUT) and credit expansion in the financial sector (CPS). The direction of the causality is from the CPS to INDOUT with statistically significant p-value of 0,05; this thus implies that CPS granger cause INDOUT without reciprocity. Also, with respect the service sector (SEOUT), a unidirectional causality is observed flowing from the CPS to the SEOUT only with statistically significant F-stat with 0,0324 p-value. Furthermore, the result reveals no causality between the lending interest rate (LINT) and the CPS. Thus, the relationship between LINT and CPS is restricted to prediction rather than causal. This is evidenced in the F-statistics of the null hypotheses for the pair of LINT and CPS which have p-values that are all greater than critical value at 0,05 significant level.

Diagnostic Tests

Table 6a. Serial Correlation LM Test

| | | | |
|---------------|----------|---------------------|--------|
| F-statistic | 2,034570 | Prob. F(5,5) | 0,2271 |
| Obs*R-squared | 21,45485 | Prob. Chi-Square(5) | 0,0007 |

Source: Author's computation using E-view 10. 0 (2023)

For an auto-correlation test, the null hypothesis, which states that the residuals are uncorrelated, is usually compared to the alternative hypothesis, which states that the residuals are serially linked. Based on Table 6a, the null hypothesis could not be ruled out because the F-statistic value was 2,03 and the p-value was 0,2271 > 0,05. The research concluded that there was no auto-correlation problem in the estimated model's residuals that would have led to skewed estimated coefficients.

Table 6b. Heteroskedasticity Test: Breusch-Pagan-Godfrey

| | | | |
|---------------------|----------|----------------------|--------|
| F-statistic | 0,305085 | Prob. F(27,3) | 0,9638 |
| Obs*R-squared | 22,72398 | Prob. Chi-Square(27) | 0,6997 |
| Scaled explained SS | 0,216559 | Prob. Chi-Square(27) | 1,0000 |

Source: Author's computation using E-view 10. 0 (2023)

The alternate hypothesis in the test for heteroskedasticity is that the residuals are heteroskedastic, while the null hypothesis states that the residuals are homoskedastic. The F-statistic's p-value is higher than the threshold value, or $p\text{-value} = 0,9638 > 0,05$, indicating that there is insufficient evidence to reject the null hypothesis; it is thus concluded that the residuals in the estimated models were devoid of heteroskedasticity complicity and the variance of the explanatory variables are homo.

Discussion of Findings

This study tested the Demand-following hypothesis as a derivative of the finance growth-theory in the Nigerian financial sector; the build up to this hypothesis was earlier championed by Robinson, (1952) but formally hypothesized by Patrick, (1966). Thus, evidence by this study showed that the growth in the real sector and the provision of credit by the financial sector are cointegrated in the long run. Moreover, the speed of convergence to equilibrium when there is temporary shock was corrected at 39%, suggesting the model is quick to adjust in the long run in case of short run disequilibrium. Also, the result showed that the growth of agriculture was positive in its effect relationship with credit provision by the Nigerian financial sector; this aligns with a priori expectation and connotes that that growth in the agricultural sector helps to weakly increase credit provision by the financial sector through demand for more finance to further boost agricultural output via investments in agriculture. In this regard, evidence of this study affirms the demand-following theory and aligns with an allusion by Adewale *et al.*, (2023) to agriculture as a potent tool for extenuating poverty in Nigeria.

The above thus implies that finance increase to the agricultural sector gives feedback to increase credit provision in the financial sector. Furthermore, this study revealed that output of the industrial sector was negatively cointegrated with the credit expansion by the financial sector. This evidence refutes the Demand-following Hypothesis induced by finance growth-theory since credits granted for the growth of the industrial sector did not give way to the expansion of credit provision by the financial sector in the long run; this means growth in the output of the industrial sector fail to generate opportunities and potentials like employment of more labour, enhanced investments scale, diversification and production expansions, which could have further created the need for more credits from the financial sector with accrued interest earnings to the sector. The potentials of the industrial sector to pave way for credit expansion in the financial sector must have been crowded out by the comatose state of the industrial sector in Nigeria which discourages industrial sector's investments due to myriads of challenges that stultify productivities in the sector.

In addition, the effect of growth in the service sector on credit expansion in the financial sector weak according to documented evidence in this study. To this extent, the result corroborates a priori expectation and implies that growth in the services sectors generates little credit demand from the financial sector to meet growing business opportunities and satisfy growing demand for their services. Generally, the weak effect between the growth of the real sector and the expansion of credit provision in the financial sector is not far from the poor infrastructural facilities, inglorious power collapse,

strangulating inflation, interest and exchange rates all of which hamper productivities in the Nigerian real sector.

Moreover, the causality test showed that there was no causality in any form running from the real sector's growth to the increase in credit provision by the financial sector. It thus implies that although, growth in the real sector negligibly facilitates expansion of credit in the financial sector, the relationship is more of effect rather than causal. Instead, it is the expansion of credit in the financial sector that caused the growth of the real sector judging by the evidence documented by this study. Based on the foregoing, the Demand-following hypothesis of finance-growth theory is refuted and rejected in Nigeria's context. The reason behind the no-causal flow from the real sector may not be far from the stage of growth in Nigeria as a developing economy which has not reached the level that can make it spur growth in the financial sector. Hence, obtained results in this study conflict with strong support for the demand-following hypothesis was found in Nigeria by the researchers Adeyeye *et al.*, (2015), Magaji *et al.*, (2021), Isu *et al.*, (2013), who also found a bi-directional causal relationship between financial development and growth indicators in the economy.

Additionally, the results are in disagreement with those of Odhiambo, (2007), who showed substantial support for the Demand-Following Hypothesis in Kenya and South Africa, but agrees partially with their study based on the evidence obtained in Tanzania. The contractions with foregoing studies are surely due to differences in estimation technique, scope of coverage, variables measurements and study objectives. The finding of this study is further in opposition to Best & Francis, (2015) who documented evidence supporting Demand-following hypothesis in Barbados. The locations of these studies may have accounted for the variations in the findings as these countries and Nigeria are at different stages of growth and development. The present study however, aligns with Sharma & Bardhan, (2017) who documented strong evidence supporting supply-leading hypothesis in Indian context but also documented weak evidence of demand-following hypothesis. In addition, the present study also agrees with Ozigbu, (2018) who revealed strong evidence of causality between the private sector lending and the manufacturing sector in Nigeria.

5. CONCLUSION AND RECOMMENDATIONS

Extant studies corroborating Demand-following hypothesis are far outdated, just as the most recent study sighted with similar objective was last conducted in 2015 thereby leaving lacuna in the literature on current evidence on this long-conjectured hypothesis that has remained a subject of debate in the literature over the decades. Moreover, extant studies are scarce on the effect of real sector's growth on the financial sector. Consequently, this study tested the demand-following hypothesis by examining the effect of real sector's growth on credit expansion in the Nigerian financial sector. The study documented that growth in the agricultural output and services sector's output were weakly positive with the expansion of credit provision in the financial sector; but the reverse is the case with respect to industrial sector. Furthermore, evidence from the causality test also revealed no directional causality flowed from the real sector to trigger expansion in the credit provision in the financial sector,

but there was causality running to the real sector from financial sector. This suggests that it is the financial sector that caused growth in the real sector and not the other way round as stated by Demand-following hypothesis. Thus, granted the tested null hypotheses in respect of both effect and causality could not be rejected, it is consequently concluded that growth in the Nigerian financial sector does not follow the Demand-following hypothesis, and by implication, not true in Nigeria's context. What is however true in Nigeria's context is the supply-leading hypothesis. Consequently, it is suggested that government should, as a matter of urgency, declare state of emergency in the real sector by addressing poor infrastructures through the rapid constructions of industrial market access roads and other inter-state link roads that are currently impeding growth of the Nigerian real sector. Also, epileptic power supply should be addressed urgently and once and for all, perhaps, by granting more licence for independent power projects with subsidy as this can reduce the overhead cost of this sector and boost their outputs to impact more on the financial sector through credit demands. Moreover, inflation and interest rates which are all stifling the growth of the real sector and preventing it from making significant cause and effect on the financial sector should receive urgent attention of the monetary authority; where possible, lending to the real sector should be at concessional interest rate while implementation of industrialization policy will help reduce some of the imported inflation bedevilling the country as a result of high demand for foreign products.

Contribution to Knowledge

Real sector is an important sector that represents a significant component of the aggregate economy. The gap created by lack of empirical studies on the effect of real sector on the financial sector has been filled up by this study. In addition, the outcome of this study has refreshed and updated the literature with most recent evidence on the Demand-following hypothesis in the context of the Nigerian financial sector. This, of course, has helped to expand the documented body of knowledge in the literature and contributed to ongoing discourse with respect to growth-finance theory.

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