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Price Intensification and Bank Growth in Nigeria

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Abstract

This study looked at how price intensification affected Nigerian bank expansion. The 37-year study period, from 1986 to 2022, was conducted in Nigeria. The CBN Statistical Bulletin, CBN Annual Report, and World Development Indicators provided the study's data. The research design utilised in this work is quasi-experimental with an ex-post facto approach. In Nigeria, the BTAGR was used as a proxy for bank growth, and price intensification was measured using the ATR, CPI, PPI, and API. The results for long-term p-value for ATR is 0.7603, while the short-term p-value is 0.7582. The p-values for both short and long-term CPI are 0.9750. No substantial short or long-term impact of the Nigerian CPI on the BTAGR is observed. The p-values for PPI in both the short and long runs are 0.7093 and 0.7138, respectively. Within Nigeria, the impact of PPI on BTAGR is minimal in both the short and long run. Short-term and long-term API p-values were 0.2218 and 0.1739, respectively. The API has minimal immediate and long-term influence on the BTAGR in Nigeria. As a result, price intensification has little effect on bank growth in Nigeria, according to the research. The study conclude that, Nigerian policymakers should concentrate on putting in place efficient monetary policies to keep ATR under control, since excessive ATR might have a detrimental impact on BTAGR by reducing purchasing power and skewing investment decisions.

Keywords: Asset Price Inflation, Bank Growth, Consumer Price Index, Intensification, Price, Producer and Price Index.

Introduction

Price intensification also knows as inflation is the continuing and substantial rise in the general price level of commodities and services within an economy. In the case of Nigeria, price intensification has become a pressing issue, negatively affecting the living standards of its citizens. The country has experienced high inflation rates for several years, leading to a significant decrease in the purchasing power of Nigerians and exacerbating issues of poverty and inequality (1). Nigeria, as Africa's largest economy has been susceptible to various factors that contribute to price intensification. The country's overwhelming reliance on oil exports, which account for much of its earnings, is one issue. Global oil price fluctuations affect Nigeria's macroeconomic stability and cause inflation. For instance, when oil prices witness a surge, it often leads to increased government spending and higher aggregate demand, which further drives up prices (2).

Another important factor contributing to price intensification in Nigeria is the weak infrastructural system, specifically in transportation and logistics. Poor road networks and inadequate storage facilities lead to increased costs of distribution, resulting in high costs for goods and services. In addition, the country's overdependence on imports for various essential items, such as food and consumer goods, further compounds the issue. Importing goods incurs additional costs like transportation, import duties, and foreign exchange fluctuations, all of which contribute to price intensification (3). Furthermore, Nigeria's monetary and fiscal policies have played a significant role in the country's price intensification. Monetary policies, such as the management of interest rates and money supply, have not always been effective in curbing inflation. Fiscal policies, on the other hand, including government spending and taxation, these policies have often failed to balance growth and price stability, intensifying prices. This significant increase has impacted the cost of living, as basic commodities have all become more expensive, squeezing the already limited incomes

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of Nigerians. Significant adjustments in exchange rates have further fueled inflation, affecting the prices of imported goods. Thus, price intensification in Nigeria is a multifaceted issue with various underlying causes. The country's heavy reliance on oil exports, weak infrastructure, import dependence, and ineffective monetary and fiscal policies have all contributed to the persistent increase in prices. The negative consequences of price intensification on the living standards of Nigerians cannot be ignored. Addressing this issue requires a holistic approach, including targeted policies to diversify the economy, improve infrastructure, enhance domestic production, and implement effective monetary and fiscal measures to stabilize prices (4). The prices intensification and bank growth are two critical aspects that have a significant impact on the Nigerian economy. However, bank growth means expanding and developing the banking industry, which drives Nigeria's economic growth. Thus, economic growth and stability require bank growth. A strong banking sector improves financial intermediation, resource allocation, investment, and economic growth (5).

Several factors influence the growth and stability of banks, including external macroeconomic indicators such as Average True Range (ATR), Consumer Price Index (CPI), Producer Price Index (PPI), and Asset Price Inflation (API). Average True Range (ATR) is a technical analysis indicator that measures market volatility by calculating the average range between the high and low prices over a specified period. High levels of market volatility can impact bank growth in Nigeria by increasing risk and uncertainty in the financial markets. High levels of market volatility can impact bank growth in Nigeria by increasing risk and uncertainty in the financial markets. Banks may face challenges in managing their asset and liability positions, leading to potential losses and affecting their profitability. The CPI is a measure of changes in the prices of a basket of goods and services purchased by households. Inflation, as reflected in the CPI, can influence bank growth in Nigeria in several ways. High inflation reduces the purchasing ability of buyers, leading to lower demand for loans and banking services. Banks may face challenges in managing their asset and liability positions, leading to potential losses and affecting their profitability. The CPI is a measure of changes in the prices of a basket of goods and services purchased by households. Inflation, as reflected in the CPI, can influence bank growth in Nigeria in several ways. High inflation reduces the purchasing ability of buyers, leading to lower demand for loans and banking services. Additionally, inflation can increase operating costs for banks, impacting their profitability and financial stability. The PPI measures changes in the prices received by producers of goods and services. Changes in producer prices can affect input costs for businesses, including banks, impacting their profit margins and overall operations. Higher PPI levels can lead to cost-push inflation, affecting bank profitability and lending activities in Nigeria. API refers to the increase in the prices of assets such as real estate, stocks, and bonds. API can have implications for bank growth in Nigeria by influencing the value of banks' loan portfolios and investment securities. Banks may face risks related to asset bubbles and market instability, impacting their overall financial performance and stability. In conclusion, ATR, CPI, PPI, and API are important macroeconomic indicators that can affect the growth and stability of banks in Nigeria. It is crucial for policymakers and bank management to monitor these indicators closely and implement appropriate measures to mitigate risks and ensure sustainable growth in the banking sector.

In Nigeria, the banking industries has undergone significant transformations in recent years, contributing to the overall expansion of the economy. The Central Bank of Nigeria (CBN) has implemented various reforms and policies to promote bank growth. These include the introduction of the Nigerian Sustainable Banking Principles (NSBPs) in 2012, which seek to integrate environmental and social considerations into banking operations (6). Furthermore, the CBN has established a robust regulatory framework to enhance transparency, improve risk management, and maintain financial stability in the banking sector. Bank growth in Nigeria has led to increased access to financial services, including banking, credit, and insurance, particularly through the expansion of branch networks and the adoption of

digital banking solutions. Thus, the prices intensification and bank growth are two interconnected factors shaping the Nigerian economy (7). Persistent inflationary pressures have implications for the cost of living, while bank growth contributes to economic development and financial inclusion. Addressing the root causes of prices intensification, such as diversifying the economy, improving infrastructure, and enhancing security, is crucial for sustainable economic growth. Additionally, continued efforts to strengthen the banking sector, promote regulatory compliance, and expand financial services will contribute to Nigeria's economic transformation.

In recent years, Nigeria has experienced a persistent increase in prices, leading to an intensified inflationary environment. According to the National Bureau of Statistics (NBS), Nigeria's inflation rate stood at 17.75% in June 2021, representing the highest rate in over three years (8). This inflationary pressure has had adverse effects on standard of living, eroding the purchasing power of consumers and increasing the cost of living. It has also posed challenges for businesses, leading to increased production costs and reduced profitability. There are several factors contributing to the prices intensification in Nigeria. Firstly, the country's heavy reliance on oil revenue exposes it to the volatility of global oil prices (9). Fluctuations in oil prices can lead to exchange rate depreciation, pushing up the cost of imported goods, including essential commodities such as food and fuel. Secondly, inadequate infrastructure, particularly in transportation and power supply, increases the cost of production and distribution, ultimately impacting prices. Additionally, insecurity, including conflicts and insurgencies, disrupts agricultural activities, driving up food prices (4).

The Nigerian banking sector plays a important function in the Nation's economic development, serving as a vital channel for financial intermediation and facilitating economic growth. In recent years, Nigeria has experienced price intensification, characterized by rising inflation rates and increased price volatility across various sectors of the economy. This study examines effect of price intensification on bank growth in Nigeria, focusing on how inflation and price volatility impact the performance and stability of banks.

Price intensification has overall implication on general price level of goods and services in an economy. In the context of Nigeria, this phenomenon has significant implications for the country's bank growth. The problem at hand involves understanding the relationship between price intensification and its impact on the growth of banks in Nigeria. Nigeria has been facing persistent inflationary pressures over the years, resulting in rising prices across various sectors of the economy. This has led to a decrease in the purchasing power of consumers, reduced savings, and increased production costs for businesses. These factors (such as ATR, CPI, PPI, and API) have a direct effect on the operations and profitability of banks in the country.

Factors contributing to the sustained increase in prices in Nigeria, such as inflationary pressures, government policies, exchange rate fluctuations, and supply chain disruptions. Understanding these factors is crucial to comprehend the extent of the problem and its implications for the banking sector. This involves analyzing various indicators of bank growth, such as asset size, profitability, loan performance, and deposit mobilization. The study explores how price intensification affects the ability of banks to generate revenue, attract deposits, and manage risks. The relationship between price intensification (proxied with ATR, CPI, PPI, and API) and economic stability is also a crucial aspect of the problem. Rising prices can lead to macroeconomic instability, affecting financial institutions' ability to operate efficiently, maintain liquidity, and manage risks. This aspect of the problem explores the interdependence between price intensification, bank growth, and overall economic stability in Nigeria.

Pricing intensification and bank growth in Nigeria are complex, thus the problem statement addresses them. By examining price intensification's causes, effects, and policy implications, this research will help policymakers, regulators, and stakeholders protect and grow the banking sector. Price intensification affects Nigerian bank expansion, thus this study studies it.

Conceptual Framework

Concept of Price Intensification: Price intensification is a phenomenon that refers to the increased pressure on pricing strategies and practices within a market, often leading to higher competition among businesses to attract and retain customers (10). Price intensification has become a crucial aspect for companies to consider in order staying relevant and profitable. One of the key drivers of price intensification is the rapid advancements in technology and globalization, which have made it easier for consumers to compare prices and switch between brands. This increased transparency has forced companies to rethink their pricing strategies and offer competitive prices to stay competitive. Recent studies have highlighted the impact of price intensification on various industries (11). For example, price intensification in the retail sector has led to a rise in price competition, with consumers expecting discounts and promotions from retailers (10). This has forced retailers to adopt dynamic pricing strategies and invest in technologies that can help those fixing market prices. Furthermore, the study emphasized the importance of data analytics in navigating price intensification. Companies that leverage big data and analytics tools are better equipped to understand consumer behavior, predict market trends, and adjust their pricing strategies accordingly to stay ahead of competitors (11). Thus, price intensification is a critical aspect of modern business strategy that cannot be ignored. Companies must continuously monitor market dynamics, consumer behavior, and competitor pricing strategies to adapt and evolve their pricing strategies accordingly. By embracing technology, data analytics, and innovative pricing approaches, businesses can successfully navigate the challenges posed by price intensification and thrive in today's competitive marketplace.

Bank Growth of Total Assets: The growth of total assets in the banking sector is a crucial indicator of the financial health and stability of banks. Total assets represent the sum of a bank's resources, including cash, loans, investments, and other financial instruments. As banks continue to expand their operations and engage in various financial activities, the size and composition of their total assets tend to change over time (12). Recent data and trends suggest that bank total assets have been steadily increasing in many economies around the world. According to a report the global banking sector experienced a significant growth in total assets in recent years, driven by factors such as economic expansion, increased lending activities, and monetary policy interventions (13). For example, in the European Union, bank total assets have also been increasing, with the European Central Bank (ECB) reporting growth in total assets of euro area credit institutions. This growth has been influenced by factors such as accommodative monetary policies, increased demand for credit, and regulatory initiatives aimed at enhancing financial stability in the region (14).The growth of bank total assets is not without its challenges and risks. As banks accumulate more assets, they may face greater exposure to financial market fluctuations, credit risks, and liquidity challenges. Therefore, it is essential for regulators, investors, and stakeholders to closely monitor the growth of bank total assets and ensure that banks maintain adequate levels of capital and risk management practices to safeguard financial stability. Thus, the growth of bank total assets is a critical aspect of the banking sector that reflects the overall health and resilience of financial institutions. By analyzing recent trends and developments in bank total assets growth, policymakers and stakeholders can gain valuable insights into the evolving dynamics of the banking sector and take appropriate measures to promote a safe and sound banking system (15).

Measures of Price Intensification: This refers to the persistent increase in price levels across various sectors of an economy, reflecting inflationary trends. In this study, it is operationalized using four proxies: ATR**,** CPI**,** PPI**,** and API.

ATR: A measure of market volatility derived from price movements over a specified period. In this context, ATR represents fluctuations in asset prices, serving as a proxy for volatility-induced inflation and its potential impact on banks growth.

CPI: An index that measures changes in the average price level of a basket of consumer goods and services purchased by households. It is a widely used indicator of inflation and is employed in this

study to evaluate the impact of retail price changes on Nigeria's banks growth.

PPI: An index that tracks the average changes in selling prices received by domestic producers for their output. It reflects inflation at the production stage and is used in this study to examine its effect on banks growth.

API: This refers to increases in the value of assets such as real estate, stocks, and commodities. In this study, API is analyzed for its potential influence on banks growth, particularly through its effects on investment and consumption.

Theoretical Framework

Structural Theory of Inflation: Introducing the structural theory of inflation (16) cited in another study (17). The theory uses the structural properties of LDCs to explain inflation, were against using traditional aggregative analysis on LDCs. In traditional aggregative analysis, supply and demand are assumed to be rationally distributed across balanced and interconnected economic systems with swift and easy production, consumption, and backward and forward linkages in response to market signals. The economies of the majority of LDCs are unstable, their economies are underdeveloped, their institutions are poor, they use their natural resources too little, and they frequently experience war.

It is difficult to perform an aggregate analysis of LDCs. According to structuralists, inequality in these countries is a reflection of the endeavour to link LDC inflation to development. Food, resources, foreign exchange, and infrastructure limitations are all mentioned in the literature. To understand inflation in LDCs, they suggest figuring out what causes different types of bottlenecks in the regular process of development and researching how the bottlenecks result in price increases and how these increases spread to the rest of the economy. Because Nigeria is among the least developed countries, structuralist theory and its recommendations are applicable.

Structuralist theory of inflation explains inflation as a result of structural economic imbalances, such as supply constraints and sectoral bottlenecks, rather than purely monetary causes. Price intensification, reflecting inflationary pressures, is measured using continuous indicators: ATR, Represents ongoing price volatility and short-term market movements. CPI, tracks continuous changes in consumer goods and services prices. PPI, Monitors steady variations in production costs while API, Assesses persistent growth in financial and real asset prices. Bank growth, a factor influencing structural inflation, is measured using the BTAGR in continuous form, capturing the dynamic expansion of bank balance sheets and its role in credit and liquidity cycles.

Empirical Review: The relationship between conventional commercial banks' profitability, inflation, capital adequacy ratio, loan-to-deposit ratio, and mobile banking in listed traditional commercial banks in Indonesia Stock Exchange were studied from 2018-2022 using a sample of 30 traditional commercial banks. The study found that inflation, capital adequacy, and loan-to-deposit ratios boost traditional commercial bank profitability while the banks profit earn from mobile banking are untouched (18). Using secondary data on macroeconomic conditions of commercial banks profitability, 22 Nigerians commercial banks that were under investigation as of June 30th, 2019 shows that banks' return on equity was affected by inflation between 1999 and 2018. The unit root test, co-integration, and ARDL showed that inflation rates do not influence Nigerian commercial banks' return on equity with an F-value of 0.6120 and a probability value of 0.6020. The government and CBN should implement effective laws and regulations to manage naira foreign exchange market inflation, according to the report (19).

Nigerian Inflation Factors with the use of co-integration and secondary dada source from 2012-2018 was analyzed through ARDL analysis and it was observed that government spending, money supply, currency rate and crude oil price are the cause of Nigeria inflation. Declining crude oil prices raise inflation, whereas exchange rate depreciation lowers it. Growth in money supply and government spending raise prices, with limits and long-term co-integration, government expenditure affects inflation (16).

The ARDL method was also used to assess several inflation drivers in Nigeria utilizing quarterly data from January 1999 to December 2018 and it was noted that inflation is not caused by money supply, but rather by poor infrastructure, currency rates,

political unpredictability, corruption, and double taxation. The findings indicate that inflation is caused by other sources. A significant long-short link is revealed by ARDL (20).

Exploring the relationship between the Consumer Price Index (CPI) and Producer Price Index (PPI) in Nigeria, the study employed econometric techniques to analyze the time series data of CPI and PPI which were sourced data from the National Bureau of Statistics, covering the period from 1995 to 2017. Johansen cointegration test and Vector Error Correction Model (VECM) were utilized to assess the long-run and short-run dynamics between CPI and PPI and the results indicated a long-run equilibrium relationship between CPI and PPI, with PPI having a significant influence on CPI in Nigeria while producer prices play a crucial role in determining consumer prices, highlighting the interconnectedness of production costs and consumer inflation. Policymakers should monitor producer prices closely as a leading indicator for consumer inflation and implement measures to control production costs to stabilize consumer prices (21)

Literature Gaps: Based on the empirical review, it is evident that no recent studies has examined price intensification and bank growth in Nigeria, however, few related studies of inflation lack consensus in their findings. Also, there is no study in the Nigeria setting that has combining used the measures of determinants of price intensification used in this study. More also, numerous studies were conducted on the extent of inflation impact on economy in Nigeria, but none has examine the price intensification and bank growth in Nigeria and beyond, this study seeks to build on those previous studies by quantitatively measuring the short and long run determinants of price intensification and bank growth in Nigeria.

Methodology

Ex-post facto and Quasi Experimental methods was used, while the quasi-experimental approach examined the causal association between price intensification and bank growth in Nigeria, the ex-post facto research design examines the relationship between price intensification and factual occurrences after the fact. The study made used of aggregates secondary data sourced from the CBN Statistical Bulletin, CBN Annual Report, and World Development Indicators. Secondary data sources from reliable institutions like the Central Bank of Nigeria (CBN) and World Bank were utilized. This study employed E-Views statistics software. This study employed the auto-regressive Distributed Lag (ARDL) Bound Co-integration test, unit root test, ARDL Co-integrating and Long form as estimation tools. The ARDL bound cointegration test models both I(0) and I(1) variables, but the unit root test determines whether data series are stable because their mean and variance are time invariant and their auto-covariance depends on the time lag between the variables. If the ARDL bound cointegration test shows no cointegration between research variables, ARDL Co-integrating and long run form testing follows. The ARDL Co-integrating experiment investigated whether divergence from long-run equilibrium affected cointegrated variables. A series robustness (diagnostic) check was performed on the model in relation to descriptive statistical and trend analysis, correlation analysis, and variance inflation factor.

The ARDL model is well-suited for this study because, it allows for the estimation of both long-run and short-run relationships between variables. It can handle variables integrated at different orders (I(0) or I(1)), avoiding the need for pre-testing all variables for stationarity. It accommodates a small sample size, which is common in macroeconomic studies of developing economies like Nigeria. It provides flexibility in testing dynamic adjustments between dependent and independent variables, making it ideal for exploring the temporal relationships outlined in the study objectives and hypotheses.

According to the study's variables, this model was specified. Bank growth was measured using the Bank Total Assets Growth Rate (BTAGR) in this study, whereas price intensification was measured using the following measures: Average True Range (ATR), Consumer Price Index (CPI), Producer Price Index (PPI), and Asset Price Inflation (API). As stated, the ARDL was:

$$\Delta BTAGR = \partial_0 + \partial_1 BTAGR + \partial_2 ATR_{t-1} + \partial_3 CPI_{t-1} + \partial_4 PPI_{t-1} + \partial_5 API_{t-1} + \sum_{i=1}^{k} \gamma_1 i \Delta BTAGR_{t-1} + \sum_{i=1}^{k} \gamma_2 i \Delta ATR_{t-1} + \sum_{i=1}^{k} \gamma_3 i \Delta CPI_{t-1} + \sum_{i=1}^{k} \gamma_4 i \Delta PPI_{t-1} + \sum_{i=1}^{k} \gamma_5 i \Delta API_{t-1} + \varepsilon \quad [1]$$

$$\Delta BTAGR = \partial_0 + \partial_1 BTAGR_{t-1} + \partial_2 ATR_{t-1} + \partial_3 CPI_{t-1} + \partial_4 PPI_{t-1} + \partial_5 API_{t-1} + \varepsilon_t \quad [2]$$

$$\Delta BTAGR = \partial_0 + \partial_1 BTAGR + \partial_2 ATR_{t-1} + \partial_3 CPI_{t-1} + \partial_4 PPI_{t-1} + \partial_5 API_{t-1} + \sum_{i=1}^{k} \gamma_1 i \Delta BTAGR_{t-1} + \sum_{i=1}^{k} \gamma_2 i \Delta ATR_{t-1} + \sum_{i=1}^{k} \gamma_3 i \Delta CPI_{t-1} + \sum_{i=1}^{k} \gamma_4 i \Delta PPI_{t-1} + \sum_{i=1}^{k} \gamma_5 i \Delta API_{t-1} + \varepsilon \quad [3]$$

K = Unrestricted Error-Correction model lag duration

First difference operator (Δ)

White noise or disturbance error term ε

Estimate the co-integrating long-run connection using the following specification:

The short-run dynamic model is specify thus:

$$\Delta BTAGR = \sum_{i=1}^{k} \gamma_1 i \Delta BTAGR_{t-1} + \sum_{i=1}^{k} \gamma_2 i \Delta ATR_{t-1} + \sum_{i=1}^{k} \gamma_3 i \Delta CPI_{t-1} + \sum_{i=1}^{k} \gamma_4 i \Delta PPI_{t-1} + \sum_{i=1}^{k} \gamma_5 i \Delta API_{t-1} + \varepsilon c_t \text{----------} 6$$

Here, Ect-1 is the error correction term for one period, and y is the coefficient for measuring adjustment speed in equation 5%.

BTAGR=Bank Total Assets Growth Rate

ATR=Average True Range

CPI=Consumer Price Index

PPI=Producer Price Index

API=Asset Price Inflation

Results and Discussion

Table 1: Summary of Descriptive Statistics

	BTAGR	ATR	CPI	PPI	API
Mean	25.83473	19.82135	19.40811	21.27586	59.76000
Median	16.03298	13.70000	12.90000	22.50335	59.38000
Maximum	199.4794	76.80000	72.80000	25.13000	109.3800
Minimum	0.504211	0.200000	5.400000	14.74811	7.630000
Std. Dev.	38.35493	17.92083	17.33015	2.874838	23.78354
Skewness	3.328668	1.813783	1.762893	-0.820849	-0.250807
Kurtosis	14.41456	5.238832	4.828053	2.473731	2.953283
Jarque-Bera	269.1941	28.01455	24.31662	4.582039	0.391273
Probability	0.000000	0.000001	0.000005	0.101163	0.822311
Observations	37	37	37	37	37

Given the huge variances between the series' maximum and minimum values, Table 1 shows significant variable variations. First, BTAGR reportedmean and SD value of 25.8347 and 38.3549, indicating moderate growth over the years as the SD value is bigger than the mean value. BTAGR had minimum and highest values of 2.2969 and 5.2768 from 1986-2022. ATR reported mean and SD values of 19.8214 and 17.9208, respectively, indicating that ATR has grown significantly over the years. Since the SD value is less than the mean value, it shows that the Nigerian government has implemented numerous ATR solutions. ATR ranged from 0.2000 to 76.8000 from 1986 to 2022. Further, Nigeria's CPI mean 19.4081 and SD was 17.3302, indicating significant development over time. SD is lower than mean, therefore this is obvious. During the study, CPI ranged from 5.4000 to 72.8000. PPI had mean and SD of 21.2759 and 2.8748, indicating a large deviation from the norm. PPI ranged from 14.7481 to 25.1300 over the research. This shows that the PPI administrator controls PPI in Nigeria, even when it rises since the mean is bigger than SD. Finally, API's mean and SD values of 59.7600 and 23.7835 indicate that API has grown significantly over time since the SD value is less than the mean value. This suggests Nigeria's economy has boosted API this year. The minimum and maximum API values are 7.6300 and 109.3800.

Table 2: Correlation Matrix for the Independent and Dependent Variables

	BTAGR	ATR	CPI	PPI	API
BTAGR	1.000000				
ATR	-0.103473	1.000000			
CPI	-0.124692	0.924783	1.000000		

PPI	0.446175	-0.459062	-0.439341	1.000000	
API	0.506567	-0.021998	-0.048808	0.758149	1.000000

PPI, API, and BTAGR in Nigeria are favourably connected with each other, but ATR and CPI have a negative correlation (Table 2). A significant, positive correlation between PPI and RGDP in Nigeria was indicated by PPI's coefficient of 0.6747. Less association exists between the other study variables. It is doubtful that multi-collinearity exists because the correlation coefficients between BTAGR and ATR, CPI, PPI, and API are less than 0.7. This state will be ascertained by more testing, nevertheless. Table 3 shows that additional predictor variables do not predict ATR, CPI, PPI, or API tolerance levels of variance. Their TV are greater than 0.10 and their VIF is less than 10. The multi-collinearity problem is absent. Variable residuals were checked for serial correlation before estimating models. Due to insignificant f-statistic p-values at 5% significance, the LM test in Table 4 shows no serial correlation in the models. According to Table 5, our data has no autocorrelation and the model is homoskendastic since five parameters have probability values over 0.05. Ramsey test shows that our regression model is well-specified and stable.

Table 3: Multi-Collinearity Test

Variables	Variance Inflation Factor (VIF)	Tolerance Value (TV)
BTAGR(-1)	0.038460	1.289008
ATR	0.906473	8.929938
CPI	0.808038	7.335589
PPI	34.50556	7.484994
API	0.204758	3.075750

Table 4: Serial Correlation LM Test

F-statistic	0.893494	Prob. F(2,27)	0.4210
Obs*R-squared	2.234746	Prob. Chi-Square(2)	0.3271

Table 5: Ramsey RESET Test

Specification: LOGRGDP LOGRGDP(-1) LOGINFLR LOGCPI LOGPPI LOGEXCHR LOGEXCHRF LOGTB C

	Value	Df	Probability
t-statistic	3.528004	28	0.0815
F-statistic	12.44681	(1, 28)	0.0915

Table 6: Summary of ADF Test

ADF test at Levels			
Parameter	**ADF test statistic**	**Test critical value @ 5%**	**Prob.***
BTAGR	1.319173	-2.948404	0.9983
ATR	-2.895522	-2.945842	0.0558
CPI	-3.473924	-2.948404	0.0148
PPI	-4.768897	-2.945842	0.0005
API	3.000242	-2.976263	1.0000
ADF test at 1st Difference			
BTAGR	-10.07638	-2.948404	0.0000
ATR	-5.674399	-2.948404	0.0000
CPI	-7.366736	-2.951125	0.0000
PPI	-3.852481	-2.948404	0.0057
API	-8.238282	-2.967767	0.0000

The table 6 above displays the study series' order of integration (stationarity). The ADF test showed that all series except CPI and PPI were stagnant at levels. After further testing, ATR, CPI, PPI, API, and BTAGR reached stationarity at first difference. Thus, all series were stationar at level and first differencing. We should explore the long-term relationship between ATR, CPI, PPI, API, and BTAGR in Nigeria since our series were stable at levels (1(0) and first differencing (1(1)).

Table 7: ARDL Bounds Test

Test Statistic	**Value**	**K**
F-statistic	2.598080	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

The F-statistic 2.598080 above the 5% threshold levels at I(0) and I(1) limits rejects the null hypothesis and indicates a long-term connection between variables in Table 7. ATR, CPI, PPI, API, and BTAGR in Nigeria are linked.

Table 8: ARGL Cointegrating and Long Run Form

Cointegrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(ATR)	-0.295924	0.952089	-0.310815	0.7582
D(CPI)	-0.028402	0.898909	-0.031596	0.9750
D(PPI)	-2.211236	5.874143	-0.376436	0.7093
D(API)	0.564958	0.452501	1.248522	0.2218
CointEq(-1)	-0.658873	0.196112	-3.359683	0.0022
Cointeq = BTAGR - (-0.4491*ATR -0.0431*CPI -3.3561*PPI + 1.3843*API + 26.9833)				
Long Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ATR	-0.449136	1.458248	-0.307997	0.7603
CPI	-0.043106	1.363902	-0.031605	0.9750
PPI	-3.356091	9.062667	-0.370320	0.7138
API	1.384275	0.993086	1.393913	0.1739
C	26.983325	157.719647	0.171084	0.8653

CointEq-1 says the model corrects its prior period's disequilibrium 65.89% annually. Thus, 65.89% annual price intensification variable increases will greatly improve them. Previous chapter hypotheses are tested: In 1986–2022, this study studied how ATR, CPI, PPI, and API affected Nigerian BTAGR. ATR, CPI, PPI, and API affected Nigerian BTAGR in the study. There were four research topics and null hypotheses. Thus, individual results are discussed below:

Table 8 reveals that a unit increase in ATR decreases short-term and long-term BTAGR by -0.2959 and -0.4491 (29.59% and 44.91%). ATR shows minor positive short- and long-term effects on BTAGR and may apply to Nigeria. ATR failed short- and long-term statistical significance tests. High ATR lowers consumer spending and BTAGR. BTAGR may suffer if the government uses contractionary monetary measures to lower ATR. ATR may also reduce foreign investment and consumer confidence, decreasing Nigeria's BTAGR. We discovered that CPI had little effect on BTAGR short- and long-term. If CPI rises 1%, BTAGR will fall -0.0284 (2.84%) and -0.0431 (4.31%) in time. Thus, a high CPI country may be disadvantageous long-term and short-term. The CPI does not yet effect BTAGR statistically. In the short and long term, CPI little affects BTAGR. Increased CPI costs

goods and services, which can reduce consumer expenditure and BTAGR. BTAGR may be affected by fiscal resources and market dynamics due to CPI price limits and subsidies.

In Table 8, a unit increase in PPI decreases Nigerian BTAGR by -2.2112 (221.2%) in the short run and -3.3561 (335.61%) in the long run. Higher PPI nations hurt BTAGR more. With p-values of 0.7093 and 0.7138, the PPI failed the short and long term statistical significance test. Because PPI changes production costs, businesses' pricing tactics and profitability shift. A significant rise in PPI may boost production costs, lower profit margins, and reduce economic investment, affecting BTAGR in Nigeria.

API improved BTAGR short- and long-term insignificantly. Positive results indicate that a 1% API increase will enhance BTAGR by 0.5650 (56.50%) and 1.3843 (138.43%) over time. Long-term and short-term benefits came from raising the country's API. API has p-values of 0.2218 and 0.1739, hence it does not alter BTAGR in the medium or long term. Short- and long-term API effects on BTAGR are negligible. Increasing import prices and API with a weaker exchange rate reduces consumer expenditure and BTAGR in Nigeria.

Conclusion

This study evaluated how price intensification affects Nigerian bank expansion. The 1986–2022 study was conducted in Nigeria. Price intensification, measured by ATR, CPI, PPI, and API, interacted with Bank Total Assets Growth Rate (BTAGR) in Nigeria. P-values for ATR's short-term and long-term were 0.7582 and 0.7603, respectively. ATR had no effect on Nigerian BTAGR short- or long-term. CPI's short- and long-term p-values are 0.9750. Thus, CPI does not affect Nigerian BTAGR short- or long-term. Short- and long-term PPI p-values are 0.7093 and 0.7138. This shows that PPI does not influence Nigerian BTAGR short- or long-term. API had 0.2218 and 0.1739 short- and long-term p-values. So API has little short- and long-term impact on BTAGR in Nigeria. Study: price intensification does not affect Nigerian bank expansion. Based on the results, the following recommendations are stated; Given that high ATR can negatively affect BTAGR by eroding purchasing power and distorting investment decisions, policymakers in Nigeria should focus on implementing effective monetary policies to keep ATR under control. The CBN should use tools like interest rates and reserve requirements to manage ATR and stabilize prices, thereby creating a conducive environment for sustainable economic growth, thus, leading to BTAGR in Nigeria.

Analyzing the CPI trends can provide valuable insights into consumer spending patterns and overall economic health. Policymakers should monitor CPI movements closely and adjust fiscal and monetary policies accordingly. Targeted interventions, such as social welfare programs or subsidies for essential goods, can help mitigate the impact of rising consumer prices on BTAGR in Nigeria.

Fluctuations in the PPI can impact production costs and, ultimately, BTAGR in Nigeria. To enhance BTAGR in Nigeria, policymakers should prioritize policies that support domestic industries, ensure price stability for producers, and promote a competitive business environment. Enhancing infrastructure, reducing regulatory burdens, and fostering innovation can help improve productivity and competitiveness in the banking industry in Nigeria and maintaining a favourable API is crucial for sustainable BTAGR in Nigeria. Policymakers should prioritize policies that boost API in the bid to increase BTAGR in Nigeria.

Limitations of the Study

Model Specification Constraints: The ARDL model, while robust, may not fully capture complex interactions between price dynamics and bank growth, especially when considering unobserved variables. However, diagnostic tests, including tests for model stability and serial correlation, were conducted to ensure the robustness and reliability of the chosen model.

Limited Scope of Variables: The study focused solely on four proxies of price intensification, potentially overlooking other relevant macroeconomic factors such as exchange rate volatility, interest rates, and fiscal policies. While the research acknowledged this limitation and recommended that future studies incorporate a broader range of variables to provide a more holistic analysis.

Generalization of Findings: The findings are specific to Nigeria and may not be directly generalizable to other countries with different economic structures and regulatory environments. Nevertheless, the study emphasized that its conclusions are context-specific and highlighted the importance of conducting similar studies in other regions to validate the findings.

Suggestions for Further Study

Inclusion of Broader Macroeconomic Indicators: Future research should integrate additional variables, such as exchange rates, interest rates, fiscal deficits, and regulatory frameworks, to explore their combined impact on bank growth in Nigeria.

Sectoral Comparisons: Further studies could compare the impact of price intensification on bank growth across different sectors within the Nigerian financial industry, such as commercial banks, microfinance banks, and development banks.

Regional Studies: To enhance the generalizability of findings, similar studies should be conducted in other African countries with similar economic and banking structures to compare results and derive broader insights.

Non-linear Relationships: Researchers should consider exploring non-linear models or machine learning techniques to identify complex and potentially hidden relationships between price intensification and bank growth.

Qualitative Analysis: Complementing quantitative analysis with qualitative approaches, such as interviews with policymakers and banking executives, could provide deeper insights into the mechanisms driving bank growth in the context of price dynamics.

By addressing these areas, future research can expand the understanding of the interplay between price intensification and financial sector development, providing more comprehensive and actionable insights.

Abbreviation

Nil.

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Akpokerere Othuke Emmanuel: Conceptualization, Methodology, Andrew O Agbada: Writing, Supervision.

Conflict of Interest

The authors declare no conflict of interest.

Ethics Approval

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