Market Risk and Financial Intermediation: Evidence from Nigeria

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https://doi.org/10.56201/ijefm.v11.no11.2026.pg246.262

Abstract
This study examined the effect of market risk on financial intermediation in Nigeria. Time series data were sourced from Central bank of Nigeria statistical bulletin. Financial intermediation proxied by net domestic credit was modeled as the function of currency risk, interest rate risk, equity price risk and commodity price risk. After cross examination of the unit root test, the study adopted the Autoregressive Distributed Lag. From the long run, the study found that net domestic credit, interest rate risk, and currency risk all showed a negative relationship with net domestic credit while the coefficient of equity price risk revealed a positive association with net domestic credit. From the ECM results, the study found that 37% of the short-run disequilibrium tends to be rectified towards the long-run equilibrium. The explanatory variables elucidated almost 82.5% of the variation in financial intermediation. Short-term estimations show a positive but statistically insignificant association between the negative association between interest rate risk and equity price risk with financial intermediation but positive and significant association between currency risk and financial intermediation. From the findings, the study conclude that market risk determines financial intermediation in Nigeria. The study recommends that financial intermediaries should employ hedging to protect themselves from the impact that fluctuations in market risk have on financial intermediation.

Keywords: *Market Risk, Financial Intermediation, Currency Risk, Interest Rate Risk, Equity Price Risk, Commodity Price Risk*

Introduction

The development of the financial sector refers to the growth and modernization of financial institutions and markets. This includes the expansion of banking services, insurance, investment, and other financial services, as well as the development of financial infrastructure such as

payment systems and stock exchanges (Adekunle & Aderemi, 2022). In developing countries, improving the financial sector is crucial for economic growth and poverty reduction. A well-functioning financial sector can increase access to credit and savings, facilitate investment, and promote financial stability. The role of financial intermediation in economic growth has been widely recognized as a leading issue in the world. This attention is well-justified, since a better understanding of how the financial sector contributes to economic growth has important regulatory implications. Central Bank of Nigeria (2017) opined that financial system is a set of rules, regulations and the aggregation of financial arrangements, institutions, agents, that interact with each other and the rest of the world to foster economic growth and development of a nation. Thus, well-functioning financial institutions enhances overall economic efficiency, create and expand liquidity, mobilize savings, promote capital accumulation, transfer resources from traditional (non-growth) sectors to the more modern growth-inducing sectors, and also encourage a competent entrepreneur response in these modern sectors of the economy (Kolawole, 2020).

The efficiency of financial systems cannot be taken for granted, especially as information gathering is one of their key functions. Financial institution facilitates the channeling of funds between lenders and borrowers indirectly. That is, savers (lenders) give funds to an intermediation institution (such as a bank), and that institution gives those funds to spenders (borrowers). Adewole, Dare and Ogunyemi (2019) stated that financial intermediation involves the transformation of mobilized deposits liabilities by banks and non-banks institutions into assets or credits such as loans and overdraft. This means that financial intermediation is the process of taking in money from depositors and lending same to borrowers for investments which in turn help the economy to grow (Manasseh, *et al., 2021*). Market risk arises on account of the adverse movements and volatility of the prices of interest rate instruments, equities, commodities, and currencies. Market risk consists of interest rate risk, liquidity risk, foreign exchange risk, commodity risk, and equity price risk. The currency risk is that of incurring losses on account of changes in foreign currency exchange rates. Variations in earnings are caused by the indexation of revenues and charges to exchange rates, or the values of assets and liabilities held in foreign currencies. Foreign exchange risk is also a part or component of market risk. Equity risk is the risk of losses due to adverse change in market price of equity prices shares and investments held by firms. Interest rates risk is due to changes in interest rates, the increase or decrease in value of assets and liabilities will not match since the bank's the assets-liabilities maturity mismatches (Hasan & Sarkar, 2002; Akani & Lucky, 2021).

Elmer (2014) defined market risk as the risk to earnings arising from changes in underlying economic factors such as interest rates or exchange rates, or from fluctuations in bond, equity or commodity prices, financial intermediaries are subject to market risk in both the management of their balance sheets and in their trading operations. Market risk is generally considered as the risk that the value of a portfolio, either an investment portfolio or a trading portfolio, will decrease due to the change in value of the market risk factors. There are three common market risk factors to banks and these are liquidity, interest rates and foreign exchange rates. Market Risk Management provides a comprehensive framework for measuring, monitoring and managing liquidity, interest rate, foreign exchange and equity as well as commodity price risk of a bank that needs to be closely integrated with the bank's business strategy. Market risk is the risk that a firm will incur losses because of a change in the price of assets held resulting from changes in interest rate, securities, commodity prices, foreign exchange rate and other market risk factors. Ekinci (2016) upholds that market risk is the risk of losses in liquid portfolio arising from the movements in market prices and consisting of interest rate, foreign currency and equity

and commodity price risks. In the words of Ekinci (2016) and Namasake (2016), market risk exposure is more volatile than credit risk exposure because of rapid changes in market condition that can cause severe financial losses and possible collapse.

According to Nwaogwugwu (2016) financial intermediation involves the transformation of mobilized deposits liabilities by financial intermediaries such as banks into bank assets or credits such as loan and overdraft. It is simply the process whereby financial intermediaries take in money from depositors and lend same out to borrowers for investment and other economic development purposes (Andrew & Osuji, 2013). Financial intermediation is a productive activity in which an institutional unit incurs liabilities on its own account for the purpose of acquiring financial assets by engaging in financial transactions on the market. Therefore, through the process of financial intermediation, certain assets or liabilities are transformed into different assets or liabilities (Weerakkody, 2016). Financial intermediation is the process by which intermediaries provide a linkage between surplus units and deficit units in the economy. There many studies on the effect of market risk, most of the studies focused on market risk and corporate performance while this study focused on market risk and financial intermediation in Nigeria.

Literature Review

Market Risks

Elmer (2014) defined market risk as the risk to earnings arising from changes in underlying economic factors such as interest rates or exchange rates, or from fluctuations in bond, equity or commodity prices. Banks are subject to market risk in both the management of their balance sheets and in their trading operations. Market risk is generally considered as the risk that the value of a portfolio, either an investment portfolio or a trading portfolio, will decrease due to the change in value of the market risk factors. There are three common market risk factors to banks and these are liquidity, interest rates and foreign exchange rates. Market Risk Management provides a comprehensive framework for measuring, monitoring and managing liquidity, interest rate, foreign exchange and equity as well as commodity price risk of a bank that needs to be closely integrated with the bank's business strategy. Market risk is the risk that a firm will incur losses because of a change in the price of assets held resulting from changes in interest rate, securities, commodity prices, foreign exchange rate and other market risk factors. Ekinci (2016) upholds that market risk is the risk of losses in liquid portfolio arising from the movements in market prices and consisting of interest rate, foreign currency and equity and commodity price risks. In the words of Ekinci (2016) and Namasake (2016) opined that market risk exposure is more volatile than credit risk exposure because of rapid changes in market condition that can cause severe financial losses and possible collapse. Interest rate is the price charges placed for the use of money, which is usually expressed as an annual percentage of the principal. The Central Bank of Nigeria (CBN) regulates the Monetary Policy Rate (MPR), formerly minimum Rediscount Rate (MRR) which is official interest rate that anchors all other interest rate in the money market and economy (Ogunbiyi & Ihejirika, 2014; Iyeneomie, & Lucky, 2024). Corb (2012) insisted that interest rate is an economic tool used by CBN to control inflation and boost economic development. Commodities are reasonably interchangeable goods or materials bought and sold freely as an article of commerce which includes agricultural products, fuels and metals that are traded in bulk on a commodity exchange or spot market (businessdictionary.com). Ildirar and Iscan (2016) opined that commodities consist of the basic materials and natural resources used in virtually all products and manufacturing process, notably among them are oil, wheat, iron

and robber that are the main components of many common goods in our lives.
Farooki and Kaplinsky (2012) classified commodities into industrial crops (Timber), Fisheries, Cereals, Beverages, Livestock, Precious metals, Coal and Petroleum products. The price changes of the most important commodities in the world's commodity exchange markets influence the price of local producers or imported productions (Algita & Indre, 2014). The exchange rate is the price of one country's currency expressed in terms of another country's currency. Exchange rate has been noted to be the product of interaction between the demand for and supply of foreign exchange (Ezejelue, 2008; Enekwe, et al., 2013; Lucky, Uzah, & Omubo-Pepple, 2023), and in effect, Oladipupo and Onotaniyohuwo (2011) opined that exchange rate movements have ripple effects on the economic activities of a nation. Inevitably, exchange rate serves as the lubricating oil in the international transactions and in that case companies as well as nations get affected either favourably or unfavourably by the swings or fluctuations in exchange rate (Enekwe, et al., 2013; Lucky & Elfreda, 2024). Agubata and Odubuasi (2018) found exchange rate to have positive effect on performance of manufacturing companies in Nigeria. Equity price change Equity price is the amount of money which one may buy or sell a share of common stock in the stock market. Hence change in equity price is the variations that occur on the price of share throughout the day especially when demand and supply vary. Mustafa and Nishat (2006) posited that market equity price is volatile and sensitive in the sense that changes occur rapidly due to political upheavals. Musyoki (2011) pointed out that asides profitability indices, other variables that affect share price includes interest rates, inflation rate, government regulation and investors behavior.

Financial Intermediation

Financial intermediation relates to the process whereby the financial institutions creating financial assets within the framework of the financial markets brings together the surplus and the deficit economic units in order to resolve their financial imbalance by means of a price related compensation mechanism called interest rate (Ezirim et al, 2012). This for deposit money banks involves deposit mobilization and credit allocation. The process involves the inflow side characterized with fund mobilization and the outflow which is referred to fund utilization (Ezirim, 2005). One of the intermediate functions of deposit money banks is bank lending. Bank lending is a major factor input to the growth and development of the economy. It is a mechanism for promoting the developing economy and remains very important despite the diverse opinions of researchers on the relationship between finance and economic growth and economic growth and finance. Banks constitute the medium for the implementation of the government monetary policies aimed at achieving the macro-economic goals of full employment, economic growth stability and Balance of payment equilibrium (Odior, 2013). Research on financial intermediation and its impact on bank performance have received limited attention in the extant literature. While there have been a number of studies on the impact of financial intermediation on economic growth and development, there has not been much work on the relationship between financial intermediation and bank performance. Akoto and Nubieu (2014) however, did their work on the impact of financial intermediation on bank profitability using data on Ghana. Also, most of the few existing works have been done outside Sub Saharan Africa. Again, most papers examine the extent of financial deepening of the banking sector by analysing financial deepening indicators. In this research, bank performance is measured using two criteria: the health status of banks and return on assets. The health status is measured, by using the solvency index which is determined by the provision for loan loss as a percentage of total loans and

advances. This is understood to represent how efficient banks are in recovering their loans and advances which is expected largely to influence bank profitability.

Theoretical Review

Financial Intermediation Theory of Banking

Financial intermediation is defined as the process of mobilization financial resources through financial institutions/ intermediaries which comprise of the surplus saving units of an economy for lending or allocation to the effectual deficit spending units. Financial intermediation theory was first formalized in the works of Goldsmith (1969) Mckinnon (1973) and Shaw (1973) who see financial markets as playing a pivotal role in economic development attributing the differences in economic growth across countries to the quantity and quality of services provided by financial institutions. This contrast with Robinson (1952) who argued that financial market are essentially handmaidens to domestic industry and respond passively to other factor that produce cross- country differences in growth. There is general tendency for the supply of finance to move with the demand for it. It seems to be the case that where enterprise leads, finance allows. The same impulses within an economy, which set enterprises on foot, make owners of wealth venturesome, and when a strong impulse to invest is fettered by lack of finance, devices are invented to release it and habits and institutions are developed. The Robinson school of thought therefore believes that economic growth will lead to the expansion of the financial sector. Goldsmith (1969) attributed the positive correlation between financial development and the level of per-capita GNP to the positive effect that financial development has in encouraging more efficient use of the capital stock. In addition, the process of growth has feedback effects on financial markets by creating incentives for further financial development. McKinnon's thesis is based on the complementarity hypothesis, which in contrast to the neo-classical monetary growth theory, argued that there is a complementarity between money and physical capital, which is reflected in money demand. According to McKinnon, complementarity links the demand for money directly and positively with the process of physical capital accumulation because the conditions of money supply have a first order impact on decisions to save and invest. In addition, positive and high interest rates are necessary to encourage agents to accumulate money balance, and complementarity with capital accumulation will exist as long as real interest rate does not exceed real rate of return on investment. Furthermore, the lumpiness of investment expenditure implies that aggregate demand for money will be greater, the larger the proportion of investment in total expenditures. Shaw (1973) proposed a debt intermediation hypothesis, whereby expanded financial intermediation between savers and investors resulting from financial liberalization (high real interest rates) and development increase the incentive to save and invest, stimulates investments due to an increased supply of credit and raises the average efficiency of investment. This view stresses the importance of free entry into and competition within the financial markets as prerequisites for successful financial intermediation. McKinnon (1973) and Shaw (1973) argued that policies leading to the repression of the financial markets reduce the incentives to save.

Supply Leading Hypothesis

This theory was authored by Schumpeter (1911) and later adopted by scholars such as McKinnon (1973); Shaw (1973); Gupta (1984); Fry (1988); Greenwood and Jovanovich (1990) and Bencivenga and Smith (1991). This theory postulates that financial development in any country causes economic growth. In an economy with no friction in the transaction, information and

monitoring costs, no financial intermediaries are needed. According to the theory, if transaction, information and monitoring costs are sufficiently high, then, no exchange among economic agents is necessary. These desires led to the emergence of financial institutions and markets that make up the financial sector. According to this theory, a well-developed financial sector will ensure reduced transaction, information and monitoring costs thereby increasing the efficiency of intermediation. The theory postulates that a well-developed financial intermediary facilitates the development of the economy through mobilization of savings, facilitation of trading and the diversification of risks among others. These important services lead to efficient allocation of resources; a more rapid accumulation of physical and human capital; and a faster technological innovation which eventually leads to a faster and long-term economic growth (Schumpeter, 1911). This theory fits this study since it provides one of the possible explanations of how development in the financial sector affects the disbursement of credits to the private sector and drives economic growth. The supply-leading growth hypothesis shows that financial development plays a significant role in economic growth and has a notable impact on the economy. Empirical evidence supporting the supply-leading hypothesis has been presented in the work of Schumpeter (1911), Goldsmith (1969), McKinnon (1973), King and Levine (1993), Arestis et al. (2001), Beck et al., (2000a), Levine (2005), Demirguc-Kunt (2006) and Luintel et al. (2014). Channels through which financial development drives growth within the economy include the efficient allocation of capital, mobilization of savings, and the reduction of the cost of information asymmetry. An efficient financial sector is a supplier of limited credit resources from the surplus units to the deficit units. By following this path, the financial sector helps to drive efficient allocation of resources and promote economic growth. Spears (1992) used the Broad Money to GDP ratio as a proxy indicator of financial developments for ten countries in sub-Saharan Africa and applied the Grangers causality test. The study concludes that there is a robust connection between financial development and economic growth. The study by Berthelemg and Varoudakis (1996) achieved equivalent results using a massive sample of global data and concluded that financial development promotes growth through the mobilization of savings. Recently, Ndako (2017) also examined the impact of national financial development on economic growth in Nigeria. Apparently, the results revealed that financial development has a crucial impact on economic growth in Nigeria.

Demand Following Hypothesis

This phenomenon is supported by intellectuals such as Robinson (1952), who have argued that an increase in economic growth typically leads to intensified financial development. Reading Robinson (1952) it seems that she expressed where business enterprises lead, finance follows. Similarly, the work of Kuznets (1955) explained that financial markets begin to grow as the economy approaches the intermediate stage of the growth path and develop once the economy matures. In other words, this reading argued that the expansion of economic activity within each economy requires the emergence of financial institutions to provide services essential to economic growth. 10 As primary economic growth creates demand for financial instruments, and financial market arrangements will respond effectively to these demands and changes. Empirical studies supporting the demand-following hypothesis include Robinson (1952), Kuznets (1955), Stern (1989), Singh (1997), Beck et al. (2000a), Odhiambo (2008), Nazlolu et al. (2009), Ductor and Grechyna (2015). They jointly argued that doubling growth gradually leads to financial sector development. Recently, Bist's (2018) study revealed this demand-following relationship for the case of some African and other low-income countries, in agreement with the demand-

following hypothesis. Moving away from the neoclassical state equilibrium analysis, to a highly developed financial system, consisting of financial intermediaries, leads to a demand following phenomena (Patrick, 1960). Under this, in response to the demand from real economy, there are the development of modern financial institutions, their financial assets and liabilities, and related financial services. This model postulates that the developments of the real economy will in itself induce increase in demand for financial services. The increase demand for financial services will spontaneously generate or lead to the introduction of new financial institutions and markets which will satisfy that increased demand for financial services.

Empirical Review

Onyegiri et al. (2024) investigated the impact that market risk had on the financial performance of deposit money banks in Nigeria from the years 1994 to 2022, which took place during the financial years. The foreign exchange risk, inflation, interest rate, and total assets of banks on return on assets, return on equity, and yield on earning assets of deposit money banks in Nigeria are the components of market risk that were investigated and formed the objectives of the study. Secondary data were obtained from the Banking Supervision Reports of the Central Bank of Nigeria and the Annual Reports of the Nigeria Deposit Insurance Corporation (NDIC). The technique that was utilised in the process of estimating the models was known as the Autoregressive Distributive Lag (ARDL) model. According to the findings of the study, market risk has not had a major impact on the changes in return on assets and return on equity of deposit money banks in Nigeria. On the other hand, market risk has had a substantial impact on the changes in yield on earning assets of deposit money banks in Nigeria. For the purpose of mitigating the risks of loss that are brought about by exchange rate conditions in Nigeria's banking industry, the study suggests that banks should manage their operations in a manner that maximises their earnings and profits. Additionally, in order to make the most of the exchange rate system in Nigeria, the banking system needs to be reengineered.

Agbana et al. (2024) investigate the influence that market and operational risk have on the performance of DMBs in Nigeria between the years 2015 and 2023. The published annual reports of thirteen (13) DMBs were combed through to obtain secondary data, which was then examined using descriptive statistics, as well as inferential statistics such as correlation and panel regression. The findings indicate that MRSK and OPSK have an impact on ROA of approximately 66%, 61%, and 65% for the pooled effect model, fixed effect model, and random effect model, respectively. On the other hand, their impact on EPS is 70%, 74%, and 73% respectively for all of the scenarios that were applied, indicating that MRSK and OPSK are positive and negative predictors, respectively. According to the findings of this study, management should make it a top priority to implement cost management methods in order to lower the ratio of operational expenditures, which would ultimately lead to increased profit margins. Abubakar et al. (2021) used panel data from the annual reports of listed oil and gas companies in Nigeria to estimate the impact of market risk on the financial performance of companies from 2008 to 2018. The time period covered by their study was from 2008 to 2018. It was decided to use an ex post facto study design, and the independent variable was represented by financial leverage, interest rate risk, and foreign exchange exposure. The dependent variable was represented by return on assets, and the independent variable was a proxy for the latter. The descriptive statistics were used for the analysis, and the fixed effect model was employed for the purpose of drawing conclusions. Based on the findings, it was discovered that financial leverage has a positive and significant impact on the financial performance of the organisation, however

interest rate risk and foreign exchange exposure do not have a significant impact on the financial performance of the organisation. According to the findings of the study, companies operating in the oil and gas industry should exercise extreme caution when contemplating investments in fixed income instruments because of the expensive interest rates involved.

Odubuasi et al. (2020) looked into the impact that market risk had on the financial performance of companies in Nigeria between the years of 2014 and 2018. The study was led by four objectives: to explore the influence of changes in interest rates, changes in foreign currency rates, changes in commodity prices, and changes in equity prices on the financial performance of oil and gas companies in Nigeria. An approach of research known as causal research was chosen, and secondary data was collected from the Statistical Bulletin of the Central Bank of Nigeria as well as the financial statements of companies operating in the oil and gas sector that are listed on the Nigerian Stock Exchange. In order to examine the data, descriptive statistics, correlation analysis, and multiple regression analysis were also utilised. According to the findings, the exchange rate has a considerable impact on both the return on assets and the return on equity of oil and gas companies. The interest rate has a considerable impact on return on equity, but almost little impact on return on assets. The change in the price of commodities does not have a substantial impact on either return on assets or return on equity. Similarly, the change in the price of equities does not have a significant impact on the return on assets and return on equity of companies operating in the oil and gas sector in Nigeria. Agbasi et al., (2024) examined the effect of market risk on financial performance of oil and gas firms listed on Nigeria exchange limited from 2018 to 2023. Four objectives were set to guide the study which included investigating the effect of exchange rate risk, commodity price, equity price risk and interest rate risk on the financial performance of firms sampled. Six oil and gas firm were sampled from the total of eight of them listed on the stock exchange as at 31st December 2023. Secondary data were collected from Central Bank of Nigeria's Statistical Bulletin and the financial statements of the firms which for the periods under review. The data were analysed with descriptive statistics, correlation and ordinary least square regression analysis. The results there from indicate that exchange rate risk has significant effect on financial performance of Oil and Gas firms. Moreover, interest rate risk has insignificant effect on financial performance. Again, results show that commodity price risk has no significant effect on financial performance. Equity price risk has no significant effect on financial performance of firms in Oil and Gas sector listed on Nigeria stock market. The study recommends among other things that the firms should engage hedging to control exchange rate risks. Agubata and Odubuasi (2018) determined the impact that fluctuations in the exchange rate have on the financial performance of manufacturing companies in Nigeria. The researchers chose eight companies from the food, beverage, and tobacco sector of the economy to make their sample. The ex post facto research strategy was utilised, and time series data of the samples were gathered from the Statistical Bulletin of the Central Bank of Nigeria as well as the financial statements of the companies that covered the period from 2005 to 2014. The Ordinary Least Square (OLS) multiple regression estimators were utilised, and the findings reveal that the exchange rate and inflation rate have a positive impact on the financial performance of the sector. On the other hand, the interest rate has a negative impact on the food, beverage, and tobacco sectors. Using a random effect model (REM) panel estimator, Abubakar (2020) investigates the influence of market risk on the market value of eight listed DMBs in Nigeria over a period of ten years, beginning in 2010 and ending in 2019. According to the findings, the degree of financial leverage (DFL) has a positive and significant impact on the market value, however the interest rate risk (IRR) and foreign exchange exposure (FEE) do not

have a significant impact on the market value. using Tobin's Q as a proxy. The OLS regression technique is utilised by Harley (2018) in order to assess the impact that fluctuations in the currency rate had on the performance of listed companies in Nigeria between the years 2012 and 2016. The findings indicate that fluctuations in the exchange rate have a considerable and significant beneficial impact on the return on investment. Ordinary least square (OLS) is the method that Mudanya and Muturi (2018) use to analyse the impact of interest rates on the profitability of eleven commercial banks in Kenya starting in 2007 and continuing through 2016. IRR and ROA are found to have a substantial negative correlation, according to the findings. Using data collected from 30 commercial banks in Kenya over the course of the period from 2006. Muriithi et al. (2016) investigated the impact that market risks had on the financial performance of commercial banks in Kenya over the course of 15 years, beginning with the 2005 fiscal year and ending with the 2014 fiscal year. For the purpose of measuring the exogenous variable, they utilised financial leverage, interest rate risk, and exposure to foreign exchange as the parameters. For the purpose of data analysis, descriptive statistics, correlation analysis, and regression approach were utilised. The study design utilised was a time series cross sectional research design, and the secondary data contained information for forty-three commercial banks that are registered in Kenya. This finding demonstrates that financial leverage, interest rate exposure, and foreign exchange exposure all have a substantial link with bank profitability that is in the opposite direction.

Literature gap

The above empirical literature reviewed focused on effect of market risk on corporate profitability using panel data sourced from financial statements of the quoted firms and central bank of Nigeria Statistical Bulletin, however this study examined the effect of market risk on financial intermediation in Nigeria which lacking in literature.

Methodology

This study used quasi experimental research design approach for the data analysis. This approach combines theoretical consideration (a prior criterion) with the empirical observation and extract maximum information from the available data. It enables us therefore to observe the effects of explanatory variables on the dependent variables. Data for this study were the annual time series data ranging from 1990-2024 which were presented in tables. The data include time series sourced from Central Bank of Nigeria Statistical Bulletin. Thus, we express the model as follows:

NDC=f(ITRR,CPR, CR,EPR) (1)

$$NDC = \alpha + \beta_1 ITRR + \beta_2 CPR + \beta_3 CR + \beta_4 EPR + e_i \quad (2)$$

Where;

NDC = Net domestic credit as percentage of gross domestic product

ITRR = Interest rate Risk as variation in real interest rate

CPR= Commodity price risk as inflation rate

CR = Currency risk as naira exchange rate per United State Dollar

EPR = Equity price risk as variation in stock market capitalization

α_0 = Intercept

$\beta_{1-}\ \beta_4$ = coefficient of independent variables to the dependent variable.

ei = error term

Unit Root Test

It is suggested that when dealing with time series data, a number of econometric issues can influence the estimation of parameter using Ordinary Least Square (OLS). Regressing a time series variable on another time series variable using Ordinary Least Square (OLS) estimation can obtain a very high R^2, although there is no meaningful relationship between the variables. This situation reflects the problem of spurious regression between totally unrelated variables generated by a non-stationary process. Therefore, it is recommended that a stationarity (unit root) test be carried out to test for the order of integration. A stochastic process that is said to be stationary simply implies that the mean [(E(Yt)] and the variance [Var(Yt)] of Y remain constant over time for all t, and the covariance [covar(Yt, Ys)] and hence the correlation between any two values of Y taken from different time periods depends on the difference apart in time between the two values for all tbs, Thomas(1993). Since standard regression analysis requires that data series be stationary, it is obviously important that we first test for this requirement to determine whether the series used in the regression process is a difference stationary or a trend stationary. The Augmented Dickey-Fuller (ADF) test is used. The ADF test simply runs a regression of the first-difference of the series against a first-lagged value, constant, and a time trend as the following:

Without Intercept and Trend $DYt = d\ Yt\text{-}1 + Ut$ (3)

With Intercept $DYt = a + d\ Yt\text{-}1 + Ut$ (4)

With Intercept and Trend $DYt = a + bT + d\ Yt\text{-}1 + Ut$ (5)

The hypothesis is

Ho: d = 0 (Unit Root)

H1: d ¹ 0

Decision rule:

Decision rule:

If t* > ADF critical value, ==> do not reject null hypothesis, i.e., unit root exists.

If t* < ADF critical value, ==> reject null hypothesis, i.e., unit root does not exist.

The test for a unit root is a test on the coefficient of (Y t-1) in the regression. If the ADF test-statistic (t-statistic) is less (in the absolute value) than the Mackinnon critical t-values, the null hypothesis of a unit root cannot be rejected for the time series and hence, one can conclude that the series is non-stationary at their levels. The unit root test tests for the existence of a unit root in three cases: without intercept and trend, with intercept only and with intercept and trend to take into the account the impact of the trend on the series.

Empirical Results

Table 1: Descriptive Statistics

	NDC	ITRR	CPR	CR	EPR
Mean	8.119475	11.36779	11.98988	13.39707	13.39138
Median	9.884573	12.23335	12.55712	14.28334	14.72614
Maximum	11.74959	15.96889	14.14140	17.02541	17.12346
Minimum	4.936702	6.766077	7.601852	6.556068	3.786460
Std. Dev.	2.501335	3.268433	2.077412	3.158305	3.696531
Skewness	-0.254479	0.007249	-0.867565	-0.769764	-0.933581
Kurtosis	1.615934	1.490394	2.565275	2.359916	2.595369
Jarque-Bera	3.986911	4.178388	5.866045	5.096401	6.691697
Probability	0.136224	0.123787	0.053236	0.078222	0.035230

Sum	391.2527	500.1829	527.5546	589.4712	589.2207
Sum Sq. Dev.	269.0371	459.3542	185.5725	428.9203	587.5665
Observations	35	35	35	35	35

Source: Extract from E-view 12.0

The descriptive statistics showed that had an average net domestic credit of 8.119475. Max and min are 11.74959 and 4.936702, over the research period. Interest rate risk average 11.36779, max of 15.96889 and mini of 6.766077. The discrepancy between the mean, maximum, and minimum values illustrates that interest rate fluctuated substantially over the research. Commodity price risk exhibits little variance over time. The study also found that commodity prices changes are regularly distributed at 5%, currency risk average 13.39707 while maximum and minimum 17.02541 and 6.556068.

Table 2: Correlation Matrix

Probability	NDC	ITRR	CPR	CR	EPR
NDC	1.000000				
ITRR	0.479501	1.000000			
	0.0010	-----			
CPR	0.939266	0.531027	1.000000		
	0.0000	0.0002	-----		
CR	0.971517	0.539347	0.976774	1.000000	
	0.0000	0.0002	0.0000	-----	
EPR	0.940796	0.590524	0.937921	0.956200	1.000000
	0.0000	0.0000	0.0000	0.0000	-----

Source: Extract from E-view 12.0

The net domestic credit exhibits a positive correlation with changes in interest rates, and a positive correlation with changes in exchange rates, interest rates, and equity price. This indicates that an increase in the variables will result in increase in financial intermediation proxy by net domestic credit.

Table 3: Unit Root Test

Variable	ADF	MacKinnon@ 1%	MacKinnon@ 5%	MacKinnon@ 10%	Order of integration
NDC	-1.365346	-3.632900	-2.948404	-2.612874	1(0)
ITRR	-4.522228	-3.592462	-2.931404	-2.603944	1(I)
CPR	-5.710576	-3.592462	-2.931404	-2.603944	1(I)
CR	-4.400235	-3.610453	-2.938987	-2.607932	1(I)
EPR	-3.999424	-3.605593	-2.936942	-2.606857	1(I)

Source: Extract from E-view 12.0

The unit root test, employing the Augmented Dickey Fuller (ADF) method, relies on the assumption that a variable's series contains a unit root, signifying non-stationarity. The ADF test statistic was contrasted with the critical value at the 5% significance level. The results revealed net domestic credit was stationary at order zero I (0), whereas all the explanatory variables demonstrated stationarity at order one I (1), this implies the application of ARDL.

Table 4: Descriptive Statistics

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	7.062464	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Actual Sample Size	34		Finite Sample: n=35	
		10%	2.46	3.46
		5%	2.947	4.088
		1%	4.093	5.532
			Finite Sample: n=30	
		10%	2.525	3.56
		5%	3.058	4.223
		1%	4.28	5.84

Source: Extract from E-view 12.0

This part looked at the long-term relationship between the variables using cointegration and the ARDL bound test. Using the Akaike Information Criteria (AIC) and the Vector Autoregression (VAR) lag length selection criteria, the ARDL bound test determined that (1,2,0,1,0) is the best lag length. Table 4 shows the findings of the bound test. Significantly, at the traditional 5% significance level, the F-statistic (7.062464) exceeded the upper critical bound value of 3.29 and, more importantly, the upper bound value of 4.093 at the 1% significance level. As a result, these findings supported a long-term relationship between the variables in the model.

Table 5: ARDL Long Run Form and Bounds Test

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	55.26981	19.40385	2.848394	0.0093
NDC(-1)*	-0.370935	0.183104	-2.025817	0.0551
ITRR **	-0.694552	0.393198	-1.766420	0.0912
CPR (-1)	-0.010770	0.018931	-0.568922	0.5752
CR (-1)	-1.389711	0.785434	-1.769355	0.0907
EPR (-1)	0.175985	0.777822	0.226254	0.8231
D(NDC (-1))	-0.245354	0.180738	-1.357512	0.1884
D(ITRR)	-0.001914	0.034714	-0.055133	0.9565
D(CR (-1))	0.073524	0.032644	2.252285	0.0346
D(CPR)	1.680424	0.686060	2.449382	0.0227
D(CPR)	-3.804385	0.952271	-3.995066	0.0006
D(CPR (-1))	-1.821312	0.904831	-2.012876	0.0565

Levels Equation

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ITRR	-1.872435	1.460597	-1.281965	0.2132
CPR	-0.029035	0.056446	-0.514389	0.6121
CR	-3.746506	3.730817	-1.004205	0.3262
EPR	0.474437	2.275375	0.208509	0.8367

C	149.0013	62.06083	2.400890	0.0252

EC = NDC - (-1.8724* ITRR -0.0290* CPR -3.7465* CR + 0.4744* EPR + 149.0013)

Source: Extract from E-view 12.0

Based on the chosen model (ARDL 1,0,3,4,0) determined through optimal lag selection criteria, the long-run elasticities were computed, and the results are showcased in Table 5. The probability values in the table indicate that some of the explanatory variables exhibited a statistically significant impact on financial intermediation measured by net domestic credit. Regardless of statistical significance, it is important to assess the direction and amplitude of the associations. The coefficient of net domestic credit, interest rate risk, and currency risk all showed a negative relationship with net domestic credit. In contrast, the coefficient of equity price risk revealed a positive association with net domestic credit.

Table 6: ARDL Error Correction Regression

ECM Regression

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NDC(-1))	-0.245354	0.097915	-2.505795	0.0201
D(ITRR)	-0.001914	0.028017	-0.068313	0.9462
D(CPR (-1))	0.073524	0.027832	2.641677	0.0149
D(CR)	1.680424	0.463167	3.628120	0.0015
D(EPR)	-3.804385	0.530582	-7.170217	0.0000
D(EPR (-1))	-1.821312	0.621677	-2.929676	0.0078
CointEq(-1)*	-0.370935	0.051437	-7.211478	0.0000
R-squared	0.857111	Mean dependent var		-0.142941
Adjusted R-squared	0.825358	S.D. dependent var		16.92317
S.E. of regression	7.072217	Akaike info criterion		6.931466
Sum squared resid	1350.439	Schwarz criterion		7.245717
Log likelihood	-110.8349	Hannan-Quinn criter.		7.038634
Durbin-Watson stat	2.050518			

Source: Extract from E-view 12.0

The outcomes of the error correction model (ECM) and the ARDL short-run estimation are presented in Table 6. Represented by CointEq(-1), the ECM model reveals a substantial value of -0.370935, statistically significant and negatively signed. This implies that 37% of the short-run disequilibrium tends to be rectified towards the long-run equilibrium. With an adjusted R-squared value of 0.825358, accounting for degrees of freedom, the explanatory variables elucidated almost 82.5% of the variation in financial intermediation proxy by net domestic product. Short-term estimations show a positive but statistically insignificant association between the negative association between interest rate risk and equity price risk with financial intermediation but positive and significant association between currency risk and financial intermediation.

Conclusion

This study examined the effect of market risk on financial intermediation in Nigeria. The study used time series data sourced from Central Bank of Nigeria. From the long run, the study found that net domestic credit, interest rate risk, and currency risk all showed a negative relationship with net domestic credit while the coefficient of equity price risk revealed a positive association

with net domestic credit. From the ECM results, the study found that 37% of the short-run disequilibrium tends to be rectified towards the long-run equilibrium. The explanatory variables elucidated almost 82.5% of the variation in financial intermediation. Short-term estimations show a positive but statistically insignificant association between the negative association between interest rate risk and equity price risk with financial intermediation but positive and significant association between currency risk and financial intermediation. From the findings, the study conclude that market risk determines financial intermediation in Nigeria.

Recommendations

i. Financial intermediaries should employ hedging to protect themselves from the impact that fluctuations in market risk have on financial intermediation. This is so that they can exert control over the volatility of market risks.

ii. Equity prices should receive less attention because changes in its price do not have a substantial impact on financial intermediation. However, equity establishes a policy that allows them to maintain an appropriate financial intermediation. They are able to respond appropriately to variations in the equity prices as a result of this.

iii. Financial intermediaries should move their focus away from the interest rate risk and instead concentrate more on increasing their effective financial intermediation functions in order to bridge savings –investment gap and restore financial equilibrium in the economy.

References

Abubakar, A., Dantsoho, M.A.,& Sadiq, S.A. (2021). Market risk and financial performance of listed oil and gas firms in Nigeria. *International Conference on Economics, Entrepreneurship and Management* 2021 (ICEEM2021)

Adewole, J.A, Dare, F.D., Ogunyemi, J.K. (2019). Implications of Financial Intermediation on The Performance of Commercial Banks in Nigeria: 2000-2017. *Financial Markets, Institutions and Risks, 3*(4), 94-105.

Agbana, J., Ibrahim, U. A., & Maitala, F. (2024). Market and operational risk impact on quoted deposit money banks' financial performance in Nigeria: *A Panel Regression Approach. Open Journal of Business and Management, 12, 2727-2753.*

Agbasi, E, Ejiofor, E. O., Joseph, U. A., Lawrence E., & Ubogu, F. (2024). Market risk and financial performance of oil and gas firms listed on Nigeria Exchange Group PLC. *International Journal of Management, Social Sciences, Peace and Conflict Studies (IJMSSPCS), 7(3), 271 – 286.*

Agubata, S.N., & Odubuasi, A.C (2018). Effect of exchange rate fluctuation on the financial performance of Nigerian manufacturing firms: Evidence from food beverage and tobacco sector. *International Journal of commerce and Management Research, 4(4), 56-61.*

Akani, H.W., & Lucky, A.L. (2021). Comparative analysis of financial sector development indicators of Nigeria and South Africa. *Book of Proceedings of the Second International Virtual Conference, 2(1), 31-41.*

Akoto, R.K. & Nabieu, G. A. A (2014). Analysis of Financial Intermediation and Profitability: "A Case Study of the Ghanaian Banking Industry. *International Journal of Economics and Finance; Canadian Center of Science and Education, 6(5), 1-13.*

Algita, R. T., & Indre, L. (2014). Effect of exchange rate fluctuation on the financial performance of Nigerian manufacturing firms: Evidence from food beverage and tobacco sector. *International Journal of Commerce and Management Research, 4*(4), 56-61.

Beck, T., Levine, R., & Loayza, N., (2000a). Finance and the sources of growth. *Journal of Financial Economics, 58, 261 – 300.*

Demirguc-Kunt, A., & Levine, R. (1999).Bank-based and market-based financial systems- cross-country comparisons. *Policy Research Working Paper Series 2143.*

Ekinci, A. (2016). The effect of credit and market risk on bank performance: evidence from Turkey. *International Journal of Economics and Financial Issues, 6*(2), 427 – 434.

Elmer, H. (2014). Financial forecasting, risk and valuation: accounting for the future, *ABACUS, 46*, 211-228.

Enekwe, C. I., Ordu, M. M., & Nwoha, C. (2013). Effect of exchange rate fluctuations on manufacturing sector in Nigeria. *European Journal of Business and Management, 5*(22), 67 – 73.

Ezejelue, A., Ogwo, E. O., & Nkemnebe, A. (2008). *Basic principles in managing research projects. 2nd edn*: Educational Books, Ltd.

Ezirim, B. C. (2005). Finance Dynamics: Principles, Applications and Techniques. Markowitz Centre for Research and Development. Port Harcourt

Ezirim, B. C., Muoghalu, M. I., & Emenyonu, E. N., (2012). Environmental correlates of the intermediation function of the Nigerian financial superstructure: *A Preliminary Investigation. FBN Quarterly Review, .2, (4), 403-421.*

Farooki, M. Z., & Kaplinsky, R. (2011). The impact of china on global commodities: *The Disruption of the World's Resource Sector*

Goldsmith, R. (1969). *Financial structure and development*. New Haven, CT, Yale University Press.

Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. *Journal of Political Economy, 98, 1076-1107.*

Hasan, I., Sarkar, S. (2002), Banks' option to lend, interest rate sensitivity, and credit availability. Review of Derivatives Research, 5(3), 213-250.

Ildirar, M., & Iscan, E. (2016). The interaction between stock prices and commodity prices: Eastern Europe and Central Asia case. *International Journal of Economics and Finance Studies, 8*(2), 94 – 103.

Iyeneomie, A.H., & Lucky, A. L. (2024). Risk and yield on government savings bonds in Nigeria. A time series study. *International Journal of Banking and Finance, 10(5), 25 – 47.*

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, 108(3), 717-737.

Kolawole, B. O. (2020). Government expenditure and infrastructure development in Nigeria. *Journal of Economic Studies, 17 (1), 1 – 14.*

Levine, R., (2005). Finance and growth: Theory and evidence. *Handbook of Economic Growth, in: Philippe Durlauf (ed.) 1 (1), 865-934.*

Lucky, A. L., & Elfreda, E.N (2024). Cost of governance and deficit financing in Nigeria: An application of Auto Regression Distributive Lag (ARDL) Model**.** *International Journal of Economics and Financial Management (IJEFM),* 9(2), 1-13

Lucky, A. L., Uzah, C.K., & Omubo-Pepple, N.S. (2023). Diversifiable risk and return on equity of quoted industrial goods manufacturing firms in Nigeria: *Journal of Banking and Investment, 1*(1), 127–147.

Manasseh, C., Okoh, J., Abada, F., Ogbuabor, J., Alio, F., Lawal, A., & Asogwa, O. (2021). Impact of financial intermediaries on Nigerian economic growth. International Journal of Financial Research, 12(348), 10–5430.

Mckinnon (1973). *Money and Capital in Economic Development.* Washington, D.C.: Brookings Institution.

Muriithi, J.G., Muturi, W.M., & Waweru, K.M. (2016). The effect of market risk in financial performance of commercial banks in Kenya. Journal of Finance and Accounting, 4(4), 225 – 233.

Namasake, W. K. (2016). The effect of market risk on the financial performance of commercial banks in Kenya. *European Journal of Accounting, Auditing and Finance Research, 8* (6), 28-45.

Odior, E. S. (2013). Macroeconomic variables & the productivity of the manufacturing sector in Nigeria: A static analysis approach. *Journal of Emerging Issues in Economics. Finance & Banking, 1(5), 362-380*

Odubuasi, A, C. (2016). The effect of exchange rate on the financial performance of firms in Nigeria. M.Sc thesis submitted to the School of Post Graduate Studies, Department of Accounting, Nnamdi Azikiwe University, Awka.

Odubuasi, A.C, Wilson-Oshilim, U.D & Prof. Ifurueze, M. (2020). Effect of market risk on the financial performance of firms in Nigeria. *European Journal of Accounting, Auditing and Finance Research, 8* (6), 28-45. https://www.eajournals.org/wp-content/uploads/effect-of-market-risk-on-the-finanical-performance-of -firms-in-Nigeria-pdf.

Ogunbiyi. S. S., & Ihejirika, P. O. (2016). Interest rate and deposit money banks profitability

nexus: The Nigerian experience. *Ariabian Journal of Business and Management Review (OMAN chapter), 3*(11), 133-148.

Oladipupo, A. O., & Onotaniyohuwo, F. O. (2011). Impact of exchange rate on balance of payment in Nigeria. *African Research Review, 5*(21), 73-88.

Onyegiri, P.K., Ibenta, S.N., & Sunday, C. (2924). Market risk and financial performance of deposit money banks in Nigeria (1994 – 2022. *African Banking and Finance Review Journal (ABFRJ), 8*(8), 121-132.

Schumpeter, J.A. (1934). The Theory of Economic Development, Cambridge, Mass, Harvard University Press

Schumpeter, J.A., (1911). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Oxford: Oxford University Press.

Shaw, E. (1973): Financial Deepening in Economic Development. Oxford University Press, London.

Shaw, E. S. (1983). Finance and Growth the Case of Macau. Monetary Authority of Macau. *34(5), 111-120.*