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Hedge accounting and the value of manufacturing firms in Nigeria

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Abstract
The study was conducted to examine the influence of hedge accounting variables on firm value of listed manufacturing firms in Nigeria. This was conceived due to the fact that the business environment is volatile, complex, multifaceted and risky and uncertainties being the order of the day, since most of the assets and liabilities of manufacturing companies in Nigeria have derivative features. Ex-post facto research design was adopted in the study using Secondary data obtained from the annual reports of the 42 sampled listed manufacturing firms for the period 2013 to 2022, the nature of the data was panel. Market value of the firms was the dependent variable, while exchange rate, interest rate, and leverage were the independent variables. Data were analyzed using Ordinary Least Squares (OLS) regression technique. Results revealed that exchange rate and interest rate were statistically significant (P-value 0.0005 and 0.0072) while leverage was not (P-value 0.5509). The coefficient of variation was 0.9603%, meaning the variables of the study account for 96.03% of the variation in firm value while 3.97% by other variables not captured in the model. It was concluded that, hedge accounting practices influence firm value of listed manufacturing companies in Nigeria. It was recommended that hedge accounting practices be standardized to reduce incidences of incurring excessive losses.

Keywords: Hedge accounting, exchange rate, interest rate, leverage and firm's value

Introduction

Effectively navigating the complexities of contemporary business operations among uncertainties and a dynamic environment is a critical responsibility that managers must undertake in order to successfully achieve the primary goals of the organisation. The operating environment of businesses is marked by many risks and uncertainties, resulting in a planning horizon that is turbulent, multifaceted, complicated, dynamic, far-reaching, impacting, and relative, regardless of the sector in which an entity works. The business operational landscape in Nigeria and globally has become increasingly unpredictable, with a heightened likelihood of encountering hazards due to the growing trends of globalisation and company internationalisation (Joe, Etim, & Obizuo, 2021) [16]. Therefore, it is necessary to engage in meticulous planning and develop effective strategies in order to improve profitability, especially when confronted with intense competition and unpredictable circumstances. Furthermore, it is worth noting that the Nigerian economy has encountered significant volatility in foreign exchange transactions, necessitating the development and execution of strategies to effectively handle these exposures. In order to mitigate or eliminate the adverse effects of financial risks, an organisation may opt to employ hedging strategies.

Nigerian manufacturing enterprises are subject to several forms of exposure stemming from nation risk, credit risk, currency risk, and interest rate risk. Country risk is a significant factor that emerges from international transactions, when businesses operating in one country experience increased expenses or diminished profits due to anticipated alterations in the economic, political, or regulatory landscape of another country or multiple nations. Credit risks are a consequence of businesses extending credit to customers, so exposing themselves to the potential of non-payment or delayed payment, which can lead to financial losses in the form of bad debts, interest expenses, and administrative costs associated with pursuing delinquent payments. Currency risk, often known as exchange rate risk or foreign exchange risk, refers to the potential risk arising from unfavourable fluctuations in exchange rates.

When a company possesses assets or liabilities that are denominated in a foreign currency, or engages in contracts involving the receipt or payment of a foreign currency, it becomes exposed to the fluctuations of that currency. Any unfavourable movement in the exchange rate can have various impacts on the company, including affecting its cash income, increasing its cash expenditure, influencing the value of its foreign assets and liabilities, and potentially undermining its competitive position in both domestic and international markets, thereby providing an advantage to foreign competitors.

Manufacturing enterprises in Nigeria are widely regarded as the catalysts for fostering economic expansion and advancement. Many manufacturing firms in Nigeria engage in international sourcing of inputs and selling of output, thereby exposing themselves to foreign exchange risks and other associated risks. It is crucial for these firms to effectively manage these risks in order to minimise the impact on their cash flows and ensure the financial stability of the entity. Similarly, manufacturing enterprises finance their operations through the acquisition of borrowed funds from commercial banks, while simultaneously engaging in credit sales to customers. This practice exposes them to potential risks associated with swings in interest rates and credit. In circumstances when the operational business environment is marked by significant uncertainties, it is imperative to establish strategies aimed at mitigating the impact of these uncertainty and associated risks. Hedge accounting is a set of accounting strategies and processes implemented by organisations with the aim of mitigating the impact of uncertainties on operational cash flows. The technique of accounting referred to is one in which adjustments made to the fair value of securities and their corresponding hedge are consolidated as a single entry. The primary objective of this study is to address the issue of reduced viability resulting from the repeated adjustments made to the value of financial instruments, commonly referred to as fair value accounting.

One of the primary concerns in the realm of foreign exchange management pertains to the potential financial losses that may arise due to the volatility of exchange rates. This risk is particularly prevalent among currencies that are considered weaker and are typically quoted forward. The exchange rate refers to the proportion at which the currency of one nation can be converted into the currency of another nation. The exchange rate is subject to various factors, including but not limited to inflation, interest rates, the balance of payment positions of the country, national income growth, government initiatives, and speculation. Manufacturing enterprises in Nigeria predominantly rely on imported inputs, including raw materials, machinery, and parts. Consequently, exchange rate fluctuations pose potential risks that could affect the value of these organisations, necessitating the implementation of hedging strategies for effective management. The interest rate refers to the percentage of the principle or the proportion of the amount lent that a lender charges a borrower. The determination of interest rates is influenced by various factors, including the inherent level of risk associated with an investment, the degree of liquidity in the market, and the prevailing rate of inflation. The implications of these factors on the value of manufacturing enterprises are twofold, encompassing both direct and indirect effects. This is due to the fact that the capital structure of firms is predominantly composed of borrowed funds. The relationship between hedge accounting practices and the value of manufacturing enterprises necessitates empirical examination in order to provide a comprehensive understanding.

The concept of leverage is intricately connected to the variable of interest rate and pertains to the proportion of a company's debt capital in relation to the valuation of its equity. The aforementioned ratio serves as a metric for assessing the profitability of an entity in relation to the interest expenses incurred from borrowed capital. The concept can be examined from either a finance or operating standpoint. It serves as an indicator of managerial competence in effectively utilising a combination of equity and debt to generate sufficient income for fulfilling interest and principal obligations, as well as providing returns to shareholders. This study examines the impact of exchange rates, interest rates, and leverage on the value of manufacturing enterprises in Nigeria, with a specific focus on their role in hedging and hedge accounting. Hence, a correlation can be established between the practise of hedge accounting and the overall worth of manufacturing enterprises operating in Nigeria. The connection between these factors can be attributed to the reliance on imported machinery, plant, equipment, and raw materials within the sector. This exposes the industry to a range of uncertainties and risks, which necessitates the use of hedging strategies to minimise potential vulnerabilities. The implementation of hedging strategies serves to mitigate the impact of currency exchange fluctuations on a firm's cash flows and overall value, hence reducing volatility. The increase in value resulting from hedging will be contingent upon the adequacy of the benefits to offset the associated costs of hedging. The primary objective of this study is to investigate the utilisation of hedge accounting as a means of evaluating the firm value of manufacturing enterprises operating in Nigeria. In contrast, the available literature in this particular field of inquiry is limited, with only a handful of studies documented. For instance, Joe, Etim, and Obizuo (2021) [16] have conducted research on commercial banks, while Alasin and Captain0Briggs (2018) [3] have explored market value. Other studies have primarily concentrated on the impact of macroeconomic variables such as interest rates, exchange rates, and inflation on the performance of manufacturing companies in Nigeria. The primary objective of this study is to investigate the impact of hedge accounting variables on the firm value of industrial companies listed in Nigeria.

Research Hypotheses
The research hypotheses for this study are stated in null form as follows:

Ho₁: Exchange rate management does not have any significant influence on firm value of listed manufacturing companies in Nigeria.

Ho₂: There is no significant relationship between interest rate movement and firm value of listed manufacturing companies in Nigeria.

Ho₃: Leverage does not significantly influence on firm value of listed manufacturing companies in Nigeria.

Review of Related Literature
The review of related literature is carried out under three sub-headings-conceptual review, theoretical framework and review of empirical literature

Conceptual Review
The key concepts of the study are explained in this section of the paper.

Hedging and Hedge Accounting
Hedging is characterised as a strategic approach aimed at mitigating the risk associated with maintaining a market position, serving as a flexible instrument for more effectively managing risk (Joe, Etim, & Obiuo, 2021) [16]. The purpose of this technique is to mitigate potential losses or gains that may arise from a related investment. An insurance-like investment is employed by organisations to safeguard against potential financial losses arising from various hazards. Various effective hedging strategies exist for reducing market risk, which are contingent upon the specific asset or portfolio of assets being hedged. There are three prevalent categories of portfolio assets, including portfolio creation, options, and volatility indications. The process of portfolio construction involves the strategic implementation of diversification techniques to form clusters of assets, hence mitigating the overall volatility. One potential strategy is to employ the purchase of "put options" as a means of mitigating the potential negative impact associated with a downward market movement. Put options increase in value when the price of the underlying securities decreases. Investors have the option to employ the volatility index (VIX) indicator as a means of hedging. The VIX index quantifies the level of implied volatility associated with at-the-money call options. Hedge accounting is a financial practise that seeks to mitigate the impact of mark-to-market fluctuations of derivatives on the profit or loss statement. The accounting approach being referred to is known as fair value hedge accounting, wherein the adjustments made to reflect the fair value of a security and its corresponding hedge are consolidated as a single entry. The objective of hedge accounting is to mitigate the impact of frequent adjustments to the value of a financial instrument, hence minimising volatility (Alice and Thomas, 2022) [2]. The primary objective of employing a hedge is to mitigate the level of volatility that is typically associated with variations in the value of an investment that is not directly correlated with the investment's overall performance.

1. **Exchange Rate Hedging:** This entails a corporation engaging in a forward contract with an investment dealer to engage in the sale or purchase of a predetermined quantity of a certain currency on a future date, at a prearranged exchange rate established at present for the forthcoming transaction. Various commonly employed methods of hedging in financial markets include Monday market hedging, currency swaps, currency leasing, forward contracts, currency futures, and currency options. The process entails the concurrent establishment of foreign assets in relation to foreign liabilities, or vice versa, with the aim of mitigating potential losses resulting from variations in exchange rates over an extended period (Etim, *et al*., 2022) [13]. The significance of this matter stems from the inherent volatility of the foreign exchange market in Nigeria, whereby the disparity between the official exchange rate and the parallel market rate is substantial. Consequently, it becomes imperative for enterprises to devise measures aimed at mitigating the impact of these fluctuations on their operational activities.

2. **Interest Rate Hedging:** This practice is frequently implemented by companies to enable eligible borrowers to exchange a vehicle with a variable interest rate for one with a fixed interest rate for a predetermined duration. This exchange serves to enhance the reliability of cash inflows. Interest rates are established by monetary agencies based on the minimum rediscount rate (MRR) margin set by the regulatory body, so falling beyond the purview of internal management supervision. In order to mitigate the impacts, it is imperative for management to embrace hedging measures, as previously discussed.

3. **Leverage:** This is when an entity uses borrowed funds (debt) for funding the acquisition of assets in the hope that the income of the new asset or capital gain would surpass the cost of borrowing.

Firm Value
The concept of firm value refers to the financial worth of a business, which is determined by considering the net value of its assets and liabilities at a specific moment in time. The determination of firm value can be accomplished by the use of several indicators, such as earnings per share (EPS), market value to book value of equity, market price of shares, market value of equity, book value of equity, price-earnings (PIE) ratio, and Tobin's Q (Suresh & Sengottaiyam, 2015) [27]. According to Jeroh (2020) [15], Tobin's Q is a metric used to assess the correlation between a firm's stock market valuation and the cost of replacing its resources. It is often regarded as the most reliable indicator of market conditions and is also known to account for a significant portion of investment variability. The concept of firm value pertains to the aggregate value of assets possessed by an entity, serving as an indicator of the overall prosperity enjoyed by the owners of said entity. The asset earning power is determined by various factors, as noted by Lukaya and Mukani (2015) [18] and Etim *et al*. (2022) [13]. The valuation of a company is determined by willing buyers and sellers who possess comprehensive knowledge of the organisation, ensuring that the information is accurate and devoid of any issues or liabilities. Sucuahi and Cambarihan (2016) [26] posited that the enhancement of firms' profitability and the augmentation of shareholders' wealth are contingent upon firm value. Consequently, the aspiration of shareholders to augment their wealth and profitability typically exerts an influence on the growth of companies in relation to their value, investment drive, and strategies for financing positioning. (Luthfiah and Suherman, 2018; Etim *et al*., 2022) [13, 19]. The assessment of an entity's worth is determined by considering the perspectives of profit maximisation and wealth maximisation, which serve as two influential factors that justify the expansion of market value. The function under consideration pertains to the stock prices as they are quoted within the capital markets. The primary factor influencing shareholders' wealth is the increase in a company's share price. This is because when the stock price rises, there is a corresponding improvement in capital gains. The market value of entities is influenced by a combination of factors, including the structure of asset management

operational and financial performances, the kind and quality of products or services, and the leverage and liquidity of a corporation. The measurement of firm value in this study was conducted by calculating the sum of the market value of equity and the book value of debts, which was then divided by the total assets (Etim *et al*., 2022) [13].

Theoretical Framework

In order to conduct a research study, it is essential to establish a theoretical framework that serves as the foundation for the research. This study incorporates the optional hedging theory as the underlying theoretical framework. This concept was introduced by Dufey in 1972 [9]. According to the individual, the risk management practices of the organisation encompass a diverse range of theories rather than being confined to a singular universally acknowledged framework. Various theories on hedging have been evolved over time. The primary emphasis lies on the examination of hedging's capacity to enhance business value, the influence of management incentives, and the optimal selection of derivative instruments for firms. The focal point lies in the trade-off between the expenses incurred and the benefits obtained through risk aversion. The theory serves as a guiding principle rather than a mere model for making calculations. According to the proponent of the theory, hedging arises as a result of managers' motivation to optimise both shareholders' wealth and their own personal utility functions. Risk-averse managers tend to participate in hedging activities when their wealth and human resources are primarily tied to the firm they oversee, and when they perceive that the cost of hedging personally is greater than the cost of hedging at the firm level. Additionally, the utilisation of hedging strategies can function as an indicator that aids external investors in gaining improved visibility into the managerial competence. This theory holds significance in the field of research as hedging operations revolve around the optimisation of returns for both shareholders and internal stakeholders, including management.

Empirical Review

This subsection of the paper provides a review of empirical studies that are relevant to the current investigation, with the aim of identifying the research gap. In their study, Essien and Akpan (2023) [12] examined the impact of hedging on the valuation of firms in Nigeria. The researchers used data from listed banks on the Nigerian Exchange Group market to conduct their analysis. The research design employed in this study was ex-post facto, and the sample consisted of 12 banks in Nigeria. The dependent variable in this study was company value, which was measured using Tobin Q. The independent variables considered in this research were foreign currency hedging and interest rate hedging. The dataset utilised in this study encompasses the time frame from 2011 to 2020. The econometric methodologies employed in this work consist of panel fixed and random effect regression approaches. The results of the study indicate that the practise of interest rate hedging has a statistically significant and favourable impact on the overall value of a corporation. The research findings also indicate that the impact of foreign exchange hedging on firm value is both negative and statistically negligible. The researchers reached the conclusion that interest rate risk has a substantial impact on the valuation of listed banks in Nigeria, while foreign currency risk has a negligible effect on the valuation of listed banks in Nigeria. The scope of this study was limited to the Nigerian banking industry, whereas the current study has shifted its attention to the manufacturing sector. In their recent study, Joe, Etim, and Obizuo (2021) [16] examined the relationship between hedge accounting and financial performance among listed commercial banks in Nigeria. The study focused on a sample of 14 listed commercial banks, with derivative assets and liabilities serving as the independent variables, and return on assets as the dependent variable. The data utilised in this study were obtained from publicly available annual reports and afterwards subjected to analysis through the application of multiple regression analysis techniques. The findings of the study indicate that there is no statistically significant impact of derivative assets and liabilities on the return on assets of banks. The previous study mostly focused on the banking sector, but this current study specifically concentrates on the manufacturing sector. In their study, Egbe, Onuora, Iteche, and Onyeanu (2021) [10] conducted an investigation into the impact of economic variables on the financial performance of Nigerian listed firms engaged in the production of consumer goods. The researchers employed an ex-post facto research design and considered several variables, including interest rate, exchange rates, consumer price index, and net assets per share. The data underwent analysis via the Ordinary Least Squares Regression (OLS) method. The findings of the study indicated that both interest rates and exchange rates had a notable impact on the net asset per share, which served as a proxy for performance. The study failed to provide an explanation for the strategic decision of corporate management to diversify their consumer goods portfolio, a practise commonly regarded as a form of hedging. Furthermore, insufficient attention was given to the operational aspects of consumer products manufacturing enterprises in relation to the impact of hedge accounting outcomes on performance. The present work aims to address this research gap. In their study, Ekadjaja and Ekadjaja (2019) [11] examined the correlation between derivative variables and the valuation of companies. The researchers utilised a comprehensive sample of all companies listed on the Indonesia Stock Exchange during the time frame of 2014 to 2016. The data analysis employed the technique of multiple linear regression analysis. The findings of the study indicate that the variables of return on assets and firm size have a statistically significant positive impact on firm value, suggesting that these factors are influential drivers of firm value. The study did not provide a clear identification of the hedge accounting variables that drive value. In this particular study, the variables of exchange rate, interest rate, and leverage were adopted to assess their influence on company value throughout the specified period.

The study conducted by Ugwu and Nwakoby (2020) [28] investigated the impact of corporate risk management on the financial performance of banks in Nigeria. Utilising data obtained through polling techniques and employing a cross-sectional research approach, this study examines a dataset including the time frame from 2010 to 2019. The collected data was subjected to analysis utilising Pearson correlation and regression analysis techniques. The results of the study indicate that risk hedging and diversification had a positive and statistically significant effect on the return on assets (ROA) of the banks examined during the specified

timeframe. The present study likewise focused on the banking sector and did not ascertain the characteristics associated with hedging as a risk management approach. The present study aims to address this limitation. Nnado and Ugwu (2016) [21] conducted a study that examined the effects of inflation on the profitability and value of specific manufacturing companies in Nigeria. The researchers utilise inflation as an independent variable to represent the hedging effect, while economic value added is employed as a proxy for profitability. In their study, they employ a simple regression model to evaluate their hypotheses. The findings of the study revealed a robust inverse correlation between inflation and business value. The current investigation employs multiple regression analysis and encompasses the entirety of the manufacturing industry.

In their 2018 study, Alasin and Captain-Briggs investigated the relationship between hedge accounting and market value of quoted manufacturing firms in Nigeria. The researchers utilised panel data evidence from a sample consisting only of oil and gas companies for their analysis. The study utilised regression analysis to examine the relationship between cash flow hedging, fair value hedging, and investment hedging with the market value of oil and gas enterprises. The results indicated that cash flow hedging exhibited a positive and statistically significant association with market value. On the other hand, fair value hedging and investment hedging demonstrated positive relationships with market value, but these relationships were found to be statistically insignificant. A limitation of their study was to the sample size, as well as the narrow focus on a single sub-sector within the manufacturing industry. This study encompasses an examination of the many subsectors within the manufacturing sector of the Nigerian economy. In their study, Nwaorgu, Ezenwanka, and Okpalukeje (2018) [22] investigated the correlation between accounting derivatives and their informational value in the financial statements of listed commercial banks in Nigeria. The researchers employed panel data and utilised the ordinary least squares regression approach. The investigation revealed that there was no statistically significant association between derivative assets and value relevance in the context of quoted money deposit banks in Nigeria. The previous research was conducted inside the financial services sector, whereas the present study represents a divergence by focusing on the manufacturing sector. Chua, Phua, and Lok (2018) [7] conducted a study examining the impact of financial derivatives, director remuneration, and board independence on earnings volatility. The study focused on a sample of 100 non-financial traded businesses in Malaysia. The results of the study suggest that a majority of companies in Malaysia do not employ derivatives, which in turn has a detrimental impact on the volatility of their profitability. The demarcation of the population and sample size in the current study was not clearly delineated, as was done in the study under consideration. Affarf, Sajid, Hamera, and Aamer (2018) [1] conducted a study to examine the factors influencing hedging decisions, specifically focusing on the impact of ownership concentration on risk management. The researchers utilised derivative instruments as a means of analysis in their investigation. A total of 101 non-financial enterprises registered on the Pakistan Stock Exchange (PSX) were considered for analysis, utilising a dataset spanning six years. The Mann-Whitney test was utilised to examine the disparity between users and non-

users, in addition to logistic regression, in order to assess the impact of ownership concentration on derivative consumption. The study's findings indicate that concentrated owners have a reduced propensity to employ derivatives as a hedging mechanism, mostly attributable to the alignment of concentrated owners' interests. The identification of hedge accounting factors or variables was not precisely delineated by the researchers in the present study. Cater, Rogers, and Simkins (2016) [5] conducted a study on the hedging behaviour of enterprises in the United States aviation industry from 1992 to 2003. The objective of their research was to determine if engaging in hedging activities contributes to the enhancement of firm value. The researchers observed a positive correlation between jet fuel hedging and the worth of airline firms when utilising Tobin's Q as a measure of firm value. The results of the study indicated that the primary advantage of employing hedging strategies within the industry was the mitigation of underinvestment expenses, as the price of fuel exhibited a strong correlation with investment prospects within the sector. The research primarily focused on companies involved in the production of jet fuel. However, the present study centres on the industrial sector of the Nigerian economy, exhibiting a greater emphasis on indigenous factors compared to the previous study, which had a foreign-oriented perspective. Parlak and Ilhan (2016) [24] conducted a study to investigate the impact of foreign exchange open positions on the financial performance of industrial and service sector enterprises in Turkey. A sample of thirty (30) organisations was utilised for the duration spanning from the third quarter of 2012 to the second quarter of 2015. The analysis of variance (ANOVA) was employed as the test statistic. The findings indicate that enterprises with a short-term foreign exchange position were able to achieve a similar level of overall profitability as entities with long-term foreign exchange positions in the event of a devaluation of the native currency. This specific study solely aimed to distinguish between short-term and long-term foreign exchange transactions, without explicitly addressing the characteristics that influence hedging trades, which is the central focus of the present study. The study conducted by Kwae, Barbangida, and Alex (2018) aimed to investigate the correlation between risk and returns in manufacturing firms listed on the Nigerian Stock Exchange. The research focused on a sample of 20 manufacturing firms operating in Nigeria. The methodology utilised for data analysis involved the application of regression analysis and computation of covariance. The results indicate a negative correlation between risk and returns, leading to the conclusion that while risk cannot be completely removed, it may be mitigated and managed through the implementation of hedging strategies, which involve diversification. The study primarily examines the management of risk and the significance of hedge accounting practices, specifically in relation to the passive control of risk and medium. However, it does not explicitly identify the essential characteristics associated with hedging. This study differs from their previous work by focusing on the identification of hedging drivers as the factors of interest, and examining their impact on firm value within the manufacturing sector of the Nigerian economy. The present study examines the empirical literature pertaining to hedging, with a particular focus on either one or two factors related to hedging. Additionally, the literature reviewed includes studies that

concentrate on specific sectors, such as commercial banks or a sub-sector within the manufacturing sector. It is worth noting that some of the reviewed studies do not explicitly investigate the impact or influence of hedge accounting variables on firm value.

Methodology

This section of the paper is devoted to the research method followed in carrying out this research.

This study employed an ex-post facto research design, utilising secondary data. Data were extracted from already available annual financial reports of quoted sampling manufacturing companies included in the study. The utilisation of this particular research methodology facilitated the investigation into the impact of hedging transactions on

the valuation of manufacturing companies in Nigeria. The data utilised in this study were obtained from the public annual financial reports of the selected manufacturing firms listed in Nigeria. The data covers the time frame from 2013 to 2021. The data utilised in this study consisted of secondary data obtained from the online domain of the organisations under investigation, as well as the database of the Nigerian Stock Exchange. The population for this study consisted of fifty-six (56) manufacturing enterprises listed on the floor of the Nigerian Exchange Group Market as of December 31, 2021. A total of forty-two (42) individuals were intentionally selected for inclusion in the study, taking into consideration the availability of all necessary information required for analysis. The sampled companies were shown on Table 1.

Table 1: Sampled Companies for the study

S. N.	Company	Sector
1	Cadbury Nigeria Plc	Consumer Goods
2	Champion Brew. Plc	Consumer Goods
3	Dangote Sugar Ref. Plc	Consumer Goods
4	Floor Mills Nig. Plc	Consumer Goods
5	Guinness Nig. Plc	Consumer Goods
6	Honeywell Flour Mills Plc	Consumer Goods
7	Northern Nigeria flour Mills Plc	Consumer Goods
8	Nasco. Allied Indust. PLc	Consumer Goods
9	Nestle Nig. Plc	Consumer Goods
10	Nigerian Brew. Plc	Consumer Goods
11	Nigerian Enamelwa Plc	Consumer Goods
12	Pz Cussons NIg. Plc	Consumer Goods
13	International Brew. Plc	Consumer Goods
14	Unilever Nigeria Plc	Consumer Goods
15	Vitafoam Nigeria Plc	Consumer Goods
16	Berger Paints Plc	Industrial Goods
17	Beta Glass Plc	Industrial Goods
18	Cement co. of North Plc	Industrial Goods
19	Cutix Plc	Industrial Goods
20	Dangote Cement Plc.	Industrial Goods
21	Greif Nigeria Plc.	Industrial Goods
22	Lafarge Africa Plc.	Industrial Goods
23	Meyer Plc	Industrial Goods
24	Portland paints Nig. PLc	Industrial Goods
25	Premier Paints Plc	Industrial Goods
26	Notore Chemical INdust. Plc	Industrial Goods
27	II Plc.	Oil and Gas
28	Conoil Plc	Oil and Gas
29	Eternal Oil Plc.	Oil and Gas
30	ARDOUA Plc	Oil and Gas
31	Japaul Oil Plc	Oil and Gas
32	Mrs. Oil Nig. Plc	Oil and Gas
33	Oando Plc.	Oil and Gas
34	Total Nig. Plc	Oil and Gas
35	Union D and C Serv. Plc.	Healthcare
36	Pharm-Deko Plc.	Healthcare
37	Neimelth Int'l Pharm Plc.	Healthcare
38	Monson Indust. Plc	Healthcare
39	May and Baker Nig. Plc.	Healthcare
40	GlaxoSmithKline	Healthcare
41	Fidson Healthcare Plc.	Healthcare
42	Ekocorp Plc.	Healthcare

***Source*:** Research's compilation (2022)

The model specification is carried out in two phases; the conceptual and empirical models. The conceptual model is

presented in the form of a diagram depicting the dependent and independent variables relationship as shown on figure 1.
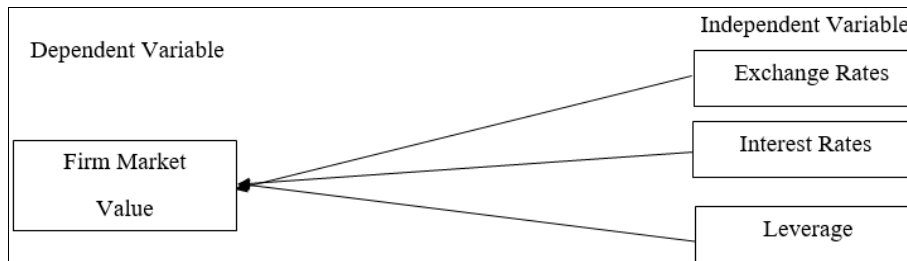
Source: Researchers Conceptualization (2022)

Fig 1: Conceptual model of the study

From the conceptual model, the empirical model is developed in both simple and multiple regression forms to address each of the research objectives, questions and hypotheses.
The general form of the model is:

$$Y = f(x)$$

Where,
Y = Dependent variable
F = Functional notation
X = Independent variable

Econometrically, the model for this study are:

$FV_{ij} = \beta_0 + \beta_1 + ER_j + U$	Equation 3.1
$FV_{ij} = \beta_0 + \beta_1 IR_j + U$	Equation 3.2
$FV_{ij} = \beta_0 + \beta_1 Lev. + U$	Equation 3.3

$FV_{ij} = \beta_0 + \beta_1 ER_j + \beta_2 IR_j + \beta_3 Inf_j + \beta_4 Lev._j + U$ … Equation 3.4

Where
FV = Market value of firms
I = Number of companies
J = Number of years
β_0 = Intercept of FV
$\beta_1, \beta_2, \beta_3,$ and β_4 Coefficient of the independent variables
N = Stochastic error term
ER = Exchange rate, IR = Interest Rate, and Lev. = Leverage

Description and Measurement of Variables
The variable of this study are measured as shown on Table 2.

Table 2: Description and Measurement of Variables

S.N.	Variable	Abbreviation	Measurement	Apriori expectation
1	Firm value	FV	Market value of equity plus book value of debts divided by total assets of listed manufacturing firms in Nigeria (Etim, *et al*., 2022) [13]	
2	Leverage	LV	Total debts or liabilities divided by total assets of listed manufacturing companies in Nigeria	positive
3	Interest Rate	IR	Annual Rate published by CBN	Negative
4	Exchange Rate	ER	Annual Rate published by CBN	Negative

Source: Researchers Compilation (2023)

Method of Data Analysis
Regression analysis (both simple and multiple) are employed in the study. The statistical tools of the regression analysis used are R^2, Adjusted R^2, t-Statistic, variance inflation factor (Vif) Durbin-Watson (DIW) statistic, P-Value and F-rate. Descriptive statistics are also considered along with the inferential statistics.

Results and Findings
The results of the regression analysis and the discussion of the findings are contained in this section of the study

Descriptive Statistics
The descriptive statistics of the data collected for this study are presented on Table 1 to evaluate the nature of the dataset.

Table 2: Descriptive Statistics of Variables

Statistic	FV	ER	INR	LEV
Mean	40.8328	6.689337	23.90088	0.59979
Median	6.47700	7.320736	22.75125	0.57100
Maximum	877.412	9.866826	31.09000	2.23000
Minimum	-14.2480	2.015236	18.36250	0.0000
Std. Dev.	124.685	2.682637	3.969734	0.30616
Skewness	4.94708	-0.523794	0.392610	1.87196
Kurtosis	28.9822	1.844546	2.017277	10.2226
Jarque-Bera	8985.74	3.851479	17.14174	769.371
Probability	0.0000	0.145768	0.0000190	0.00000
Sum	11392.3	254.1948	6214.229	167.340
Sum Sq. Dev	432187.9	266.2720	4081.526	26.0574
Observations	293	293	293	293

Source: Researcher's Computation (2022)

According to the data presented in Table 1, the mean value of Firm Market value (FMV) was 40.838. This finding represents the mean value of market value (MV) for the selected manufacturing enterprises in Nigeria over the duration of the study. The data set exhibited a range of values, with the highest recorded value being 877.412 and the lowest recorded value being -14.248. The median value of the data set was 6.477, suggesting significant variability. This variability is further supported by the standard deviation, which was calculated to be -14.248. The dataset exhibits a skewness value of 4.947 and a kurtosis value of 28.982, indicating a significant departure from the normal distribution. The analysis of the Exchange Rate (ER) revealed a negative skewness of -0.523794 and a standard deviation of 2.682637. These findings suggest that the ER deviates below the mean, indicating a significant impact on the valuation of listed industrial enterprises in Nigeria throughout the study period. The interest rate (INR) data exhibits normality, as evidenced by the Jarque-Bera probability value of 0.0000, which is below the conventional significance level of 0.05. Furthermore, the data has positive skewness with a value of 0.392 and a kurtosis of 2.017. The mean and median values of the interest rates due or receivable by these enterprises upon making hedging decisions were 23.90 and 22.7, respectively, suggesting the average rate. The affirmation of this statement is reinforced by the presence of maximum and minimum values of 31.0900 and 18.36250, respectively, resulting in a range of 12.73.According to the findings presented in Table 1, the variable of leverage (LEV) demonstrated normalcy. This is supported by the Jarque-Bera probability value, which was less than 0.05.

Additionally, the data for the variables showed positive skewness, with a value of 1.872, and a kurtosis of 10.223. These results indicate that the level of leverage during the study period was significantly higher than what would be expected under a normal distribution. Indeed, the use of leverage played a significant role in the hedging techniques employed by the manufacturing firm under investigation.

Test of Multicollinearity
The multicollinearity between the predictors (independent variables) were tested using the Variance Inflation Factor (VIF). The results computed were presented in Table 3.

Table 3: Test of Multicollinearity

Variable	Coefficient variance	Uncentered VIF	Conferred VUIC
ER	69.55775	77.45637	1.097959
INR	23.41637	2.026829	1.125096
LEV	696.5765	6.445578	1.328489
C	4625.493	94.45416	NA

Source: Researcher's Computation (2022).

From the results presented in Table 3, it was discovered that all the predictors had centered VIC of less than ten (10). This implied that, there was no problem of multicollearity among the independent variables of the study.

Correlation Analysis
The correlation matrix for all the variables of the study were computed to examine the coefficient of relationship among the factors. The results were presented in Table 4.

Table 4: Correlation Matrix

Variables Correlation	ER	INR	LEV	FV
ER	1.0000			
INR	-0.080134	1.00000		
LEV	-0.128682	0.049146		
MV	0.326033	-0.070398	1.0000	
Probability	ER	INR	0.30188	1.0000
ER	---		LEV	FV
INR\	0.5747	---		
LEV	0.0317	0.4135	`	
FV	0.0000	0.2512		

Source: Researcher's Computation (2022).

Table 4 Shows the relationship between an independent variable and another independent variable. From the matrix, the correlation coefficient were less than 60% (0.6) indicating that there is no sign of multicollinearity existing among the pairs of independent variables.

Test of Hypotheses
The hypotheses stated in section 1 of the paper are tested in this section

Table 5: Model Summary

Model	R	R-Square	Adjusted R^2	Std. Error of Estimate
1	0.9667	0.9603	0.9603	64.0216

Predictors (constant). ER, INR, LEV
Source: Researcher's computation (2022)

Table 5 presents the model summary of the multiple regression analysis utilising the fixed effect model. Based on the obtained result, the correlation coefficient (R) was determined to be 0.9667 (96.67%). This value suggests the presence of a perfect positive association between the dependent variable and the regressors (independent variables). The coefficient of determination (R^2) and its adjusted counterpart yielded a value of 0.9603 (96.03%). This indicates that approximately 96.03% of the variability in the dependent variable can be explained by the independent variables, while the remaining 4% is attributed to factors not included in the model but accounted for by the error term (i.e., the standard error of the estimate). This suggests that the currency rate, interest rate, and firms' leverage level are significant factors in determining the market value of manufacturing companies in Nigeria. Managers of these companies are required to engage in hedging efforts to mitigate the adverse impacts on their operations.

Table 6: ANOVA

Model	Sum of Squares	DF	Mean Square	F	Sig
1 Regression	481.445	292	1898.05	151.48	0.000
Residuals	325.934	1	12.582		
Total	807.429	293			

a) Dependent variable: Firm Market Value
b) Predictors: ER, INR, LEV
Source: Researcher's Computation (2022)

The Table 6 shows the regression results for Analysis of variance (ANOVA) with F-ratio of 151.456 and P-value of 0.0000 less than 0.5 explained that the R^2 and adjusted R^2 were statistically significant and that the index is robust and good for policy formulation. This implies that the variables for hedge accounting are statistically important determinants of firm market value in Nigeria.

Hypothesis One
Exchange rate management does not have any significant influence on firm value of listed manufacturing companies in Nigeria.
To test this hypothesis, the model evaluation is shown as follows:
$MV_{ij} = \beta_0 + \beta_1 ER_{ij} + U$
$MV_{ij} = 13.799636 + 5.197484ER + 0.693554$
$T = 3.068980$
$Prob = 0.0005$
$Sig. Level = 0.05$

Based on the evaluation of the model, it was observed that the management of exchange rates had a notable and statistically significant impact on the market value of industrial companies listed in Nigeria. The meaning of this statement is that a one-unit change in the exchange rate corresponds to a 5.197484 unit movement in market value. Furthermore, it is noteworthy that the obtained p-value of 0.005 is lower than the predetermined significance level of 0.05. Consequently, we may confidently reject the null hypothesis and accept the alternative hypothesis, which posits that the management of exchange rates significantly contributes to the improvement of a firm's market value. This aligns with the findings of Ceriawate and Endri (2018) [6], who conducted a study on the factors influencing the valuation of companies listed on the Indonesia Stock Exchange (ISE).

Hypothesis Two
There is no significant relationship between interest rate movement and firm value of listed manufacturing companies in Nigeria.
Model Evaluation for Hypothesis 2:
$MV_{ij} = \beta_0 + \beta_2 IR_{ij} + U$
$MV_{ij} = 13.79686 + 0.486005IR + 0.181793$
$T = 2.673453$
$Prob = 0.0072$
$Sig. Level = 0.05$

Based on the findings of the model evaluation, it can be concluded that there is a statistically significant and positive relationship between interest rate movement and the market value of listed manufacturing companies in Nigeria. Given that the p-value of 0.0072 is below the predetermined significance level of 0.05, the null hypothesis is deemed invalid and the alternative hypothesis is deemed valid. This

finding suggests that a one-unit change in interest rate movement is associated with a 0.486015 unit increase in firm market value. The results align with the research conducted by Mohammed (2017) [20], which examined the empirical relationship between macroeconomic factors and the market valuation of manufacturing firms in Nigeria.

Hypothesis Three
Leverage does not significantly influence firm value of listed manufacturing companies in Nigeria.
Model evaluation for hypothesis three;
$MV_{ij} = \beta_0 + \beta_3 LEV_{ij} + U$
$MV_{ij} = 13.79686 - 16.67442LEV + 7.47259$
$T = -2.231360$
$Prob = 0.0262$
$Sig. Level = 0.05$

Based on the findings of the model evaluation, it can be observed that the debt-to-asset ratio exhibited a negative and statistically negligible impact on the market value of manufacturing companies listed in Nigeria. The findings indicate that an increase in leverage, namely the debt-to-asset ratio, among the manufacturing companies listed linked to a fall in the market value of the firms. This implies that the hedging actions undertaken by corporations exhibit an inverse relationship with firm value, potentially due to the requirement of paying interest on funds prior to making them accessible to stock holders. This study is inconsistent with the research conducted by Oghulu and Emni (2012), which examined the impact of capital structure on a firm's value.

Discussion of the Findings
The effective management of companies, especially those in the manufacturing sector, during periods of uncertainty and volatile environments necessitates a comprehensive comprehension of hedging dynamics and hedge accounting. This involves the strategic reallocation of an entity's assets from a market or sector characterised by low returns and high risk to one that offers more promising returns. In practical terms, this entails the administration and oversight of all financial instruments, or assets, held by a corporation. The primary aim of hedge accounting is to accurately reflect, within the financial statements, the impact of risk management endeavours stemming from exposures that have the potential to impact profit or loss or other comprehensive income. This study identified three characteristics that serve as indicators and drivers of hedge accounting practices.
The findings of the analysis regarding exchange rate management, specifically foreign transaction practices, revealed that manufacturing companies listed in Nigeria actively employed foreign currency hedging strategies to mitigate their exposure to foreign exchange risk. The results demonstrated a notable and favourable impact of this

variable on the market value of manufacturing companies in Nigeria throughout the study period. The fluctuation of interest rates plays a significant role in determining the expenses associated with capital acquisition or finance, whether through borrowing or lending. The aforementioned variable exhibited statistical significance and exerted a favourable impact on the market value of manufacturing companies listed in Nigeria. The interest rate represents the percentage that a lender imposes on a borrower as a charge for borrowing funds, calculated based on the principal amount of the loan.

The utilisation of loan finance is a crucial component in hedging strategies for the majority of manufacturing enterprises in Nigeria. The effective management of debt funds necessitates the implementation of hedge accounting procedures in order to mitigate the potential risks connected with credit default and other related business risks. Leverage management refers to the assessment of an entity's debt-to-assets or debt-to-equity ratio. Leverage refers to the utilisation of borrowed capital (debt) to finance the procurement of assets and operations, with the expectation that the resulting income or capital appreciation will exceed the borrowing costs. The allocation of the entity's funds is strategically designed to minimise risk exposure and improve the company's overall creditworthiness. The exploration of this feature and component of hedge accounting is of significant importance to manufacturing organisations, as it allows them to mitigate potential losses resulting from various transactions. The study's findings indicate a negative relationship between leverage and company market value. This implies that enterprises with significant levels of leverage face challenges in obtaining additional capital for the purposes of diversification or hedging strategies. The inclusion of the inflation rate as a control variable in the model demonstrated a negative impact on the market value of industrial companies listed in Nigeria. This finding aligns with the pre-existing expectation. This suggests that inflation diminishes the actual value of an entity's assets, even when employing hedging strategies.

Conclusion
Hedge accounting is the structuring of investment portfolio in a manner that market volatility does not adversely affect operations and the going-concern status of an entity. The study findings has demonstrated that hedge accounting is a strategy potent to handle derivative assets and liabilities, and for absorbing. Market shocks from business risks and uncertainties. The variables identified and used as hedge accounting indicators were statistically signed and good influencers of hedging and performance smoothens. In line with the study outcomes, the following recommendations are made: Hedge accounting policies should be made standardize policies for all companies listed on the Nigerian Stock Exchange to reduce incidences of continual losses and insolvency often associated with companies in Nigeria. Risk management strategies particularly derivatives, options and future should be integrated into the functional and operational level activities as against the current practice of leaving to top management or corporate level strategy. Experts in hedge accounting should be engaged, trained and retrained to handle hedging transactions.

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