

Evaluation of Determinants of Firms' Hedging Strategies and Performance of Manufacturing Companies in Nigeria

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Abstract: This study was an evaluation of the determinants of hedging strategies and performance of the manufacturing firms in Nigeria. The objective was to determine the effect of interest rate hedging and currency hedging on Average Manufacturing Capacity Utilization (MCUT) in the manufacturing sector in Nigeria from 1990 to 2021. Ex post-facto research design was adopted for the study. Data on the proxies for the dependent and independent variables were collected from the Central Bank of Nigeria (CBN) Statistical Bulletin 2021, and the socio-economic report by National Bureau of Statistics (NBS) (various years). The data was analysed using trend and multiple regression analysis. The results revealed that interest rate hedging and foreign currency hedging have inverse and statistically significant effect on Average Manufacturing Capacity Utilisation (MCUT) of the manufacturing sector in Nigeria. These independent variables explained 41.91 per cent of the variations in the performance of the manufacturing sector. It was concluded that the determinants of hedging strategies have significant effect on the performance of the manufacturing sector in Nigeria. Recommendations made include that there is need for interest rate regulation, and proper foreign exchange management to enhance hedging activities and catalyse improved performances in the manufacturing sector.

Keywords: Hedging, interest rate, foreign currency, Average capacity utilization.

1. INTRODUCTION

The manufacturing sector plays a catalytic role in any modern economy and has many dynamic benefits that are crucial for economic transformation.

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In a typical advanced country, the manufacturing sector is a leading sector in many respects. It is an avenue for increasing productivity related to import replacement and export expansion, creating foreign exchange earning capacity; and raising employment and per capita income which causes consumption patterns to increase (Ogar & Charles 2014). Furthermore, it creates investment capital at a faster rate than any other sector of the economy while promoting wider and more effective linkages among different sectors. In terms of contribution to the Gross Domestic Product (GDP), the manufacturing sector is dominant but has been overtaken by the services sector in a number of organizations for Economic Co-operation and Development (OECD) countries (Anyanwu, 2003).

Many firms and financial institutions collapsed during the 1997 East Asian financial crisis and subsequently the 2007/2008 global financial crisis due to poor risk management (Siddika & Haron, 2020). Manufacturing companies in Nigeria were not left out of this collapse. In fact, it was not only the aftermath of these global financial crises, the local economic distortions were also complicit in the demise of many manufacturing concerns, since they could not survive under the weight of dire economic consequences. These pathetic socio-economic situations became worse with increasing price instability, scarcity of foreign exchange rate, and the fluctuations in interest rate that were imminent, and the various security issues. Others were the epileptic power supply in the country, and the continuous contentious issues of high price of Automotive Gas Oil (AGO), with which most of the manufacturing companies run their generators. These and other contagion effects contributed to the dire state of the manufacturing sector in the country, and this is evidenced by the high amount of foreign goods imported into the country from countries like China, as well as the unstable state of the manufacturing capacity utilisation. Apart from these, the increasing level of unemployment rate, and the number of companies that rely on loans or other sources of capital, just to finance working capital needs (Okunade, 2018).

Regardless of these myriads of changes that have faced the manufacturing firms in Nigeria, many have adopted different strategies towards ensuring that the going concern status is not affected. These strategies have been aimed at ensuring that fluctuations and various kinds of risks arising from both their internal and external environment are well contained. One of these strategies is hedging which allows these manufacturing firms to protect their operations from the idiosyncrasies of the financial markets in the country. In line with this, an evaluation of the determinants of these hedging strategies by manufacturing firms in the industry was conceived, with a view to contributing to existing literature,

and ensuring that the manufacturing firms use. This to their advantages, is considered necessary.

1.1. Statement of the Problem

Indeed, there are several challenges facing the manufacturing sector in Nigeria. These include economic, social, and environmental challenges. The economic challenges include those that emanate from high inflation, depreciation of the local currency in the foreign exchange market, fluctuating interest rates, and other economic policies appear inimical to the growth of the industry. There are also social problems which include the high level of insecurity in the country, debilitating power supply, as well as poor infrastructural system in the country. These are known to affect the performance of the manufacturing industry in the country with recent reports on domestic output by the National Bureau of Statistics (NBS) suggesting that the contribution of the manufacturing sector to the Gross Domestic Product (GDP) in Nigeria has reduced to abysmal levels that point to everything not being well with the industry.

Again, interest rate and exchange rate fluctuations in the country has become very incessant making it difficult even for experts to predict the next destination of these important rates in the financial markets in Nigeria. For manufacturing firms in Nigeria who rely on banks and other financial institutions for their loans and other advances, as well as foreign exchange needs, these fluctuations raise the level of risks associated with repaying loans, raising new finance for expansion, or even financing and purchase of equipment for their factories. These lead to high cost of loans, and the possibility of default, as well as high or increased costs of machineries and equipment from foreign countries. This possibly may place a lot of pressure on the management of these manufacturing firms to work to increase the level of importance regardless. Evaluating whether the determinants of the hedging strategies adopted by manufacturing firms for interest rate and foreign currency fluctuations affects the performance of the manufacturing sector in Nigeria remains an area of research interest, which is the focus in this study.

1.2. Objectives of the Study

The aim of this study is to evaluate the effect of the determinants of hedging strategies on the performance of the manufacturing sector in Nigeria. The specific objectives include to:

- i) Assess the trend of interest rate hedging, foreign currency hedging, and average manufacturing capacity utilisation in Nigeria from 1990 to 2021.

- ii) Evaluate the effect of interest rate hedging on average manufacturing capacity utilization in Nigeria from 1990 – 2021
- iii) Examine the influence of foreign currency hedging on average manufacturing capacity utilization in Nigeria from 1990-2021
- iv) Evaluate the combined effect of interest rate and foreign currency hedging on average manufacturing capacity utilisation in Nigeria from 1990 to 2021.

1.3. Research Hypothesis

The null hypothesis for his study is stated thus:

- H_{01} : Interest rate hedging does not have significant effect on average manufacturing capacity utilization in Nigeria from 1990-2021
- H_{02} : Foreign currency hedging does not significantly influence average manufacturing capacity utilization in Nigeria from 1990-2021
- H_{03} : Interest rate and foreign currency hedging have no significant effect on average manufacturing capacity utilisation in Nigeria from 1990 to 2021.

2. LITERATURE REVIEW

2.1. Hedging

Hedging is an important protection that investors can use to protect their investments from sudden and unforeseen changes in the financial markets. It is a financial strategy that should be understood and used by investors because of the advantages it offers. As an investment strategy, it protects an individual's finances from being exposed to a risky situation that may lead to loss of value. However, hedging does not necessarily mean that the investments would not lose value at all. Rather, in the event that it happens, the losses will be mitigated by gains in another investment (Huang, 2015). In the financial sense, a hedge, or hedging is a risk management method which helps investors to mitigate loss against movements in an asset's price. Hedging is recognizing the dangers that come with every investment and choosing to be protected from any untoward event that can impact one's finances. One clear example of this is getting car insurance. In the event of a car accident, the insurance policy will shoulder at least part of the repair costs (Adam & Fernando, 2006).

Hedging is the balance that supports any type of investment. A common form of hedging is a derivative or a contract whose value is measured by an underlying asset. Say, for instance, an investor buys stocks of a company

hoping that the price for such stocks will rise. However, on the contrary, the price plummets and leaves the investor with a loss. Such incidents can be mitigated if the investor uses an option to ensure that the impact of such a negative event will be balanced off. Hedging can be used in various areas such as commodities, which include things such as gas, oil, meat products, dairy, sugar, and others. Another area is securities, which are most commonly found in the form of stocks and bonds. Investors can buy securities without taking possession of anything physical, making them an easily tradable property. Currencies can also be hedged, as well as interest rates and weather (Alam and Gupta, 2018).

2.2. Hedging Strategies

There are various hedging strategies, and each one is unique and effective in reducing market risk, depending on the asset or portfolio of assets being hedged. Investors are encouraged to use not just one strategy, but different ones for the best results. Below are some of the most common hedging strategies that investors should consider according to Ameer (2009):

(i) Diversification: The adage “do not put all your eggs in one basket” never gets old, and actually makes sense even in finance. Diversification is when an investor puts his finances into investments that don’t move in a uniform direction. Simply put, it is investing in a variety of assets that are not related to each other so that if one of these declines, the others may rise. For example, a businessman buys stocks from a hotel, a private hospital, and a chain of malls. If the tourism industry where the hotel operates is impacted by a negative event, the other investments won’t be affected because they are not related.

(ii) Arbitrage: The arbitrage strategy is very simple yet very clever. It involves buying a product and selling it immediately in another market for a higher price; thus, making small but steady profits. The strategy is most commonly used in the stock market. Let’s take a very simple example of a junior high school student buying a pair of Asics shoes from the outlet store that is near his home for only \$45 and selling it to his schoolmate for \$70. The schoolmate is happy to find a much cheaper price compared to the department store which sells it for \$110.

(iii) Average down: The average down strategy involves buying more units of a particular product even though the cost or selling price of the product has declined. Stock investors often use this strategy of hedging their investments. If the price of a stock they’ve previously purchased declines significantly, they buy more shares at the lower price. Then, if the

price rises to point between their two buy prices, the profits from the second buy may offset losses in the first.

(iv) Staying in cash: This strategy is as simple as it sounds. The investor keeps part of his money in cash, hedging against potential losses in his investments.

(v) Options: Options are another powerful tool of hedging. An option is an agreement that lets the investor buy or sell a stock at an agreed price within a specific period of time. It allow investors to protect against the risk of big losses. In this case, a put option would enable the investor to make a profit from the stock's decline in price. That profit would offset at least part of his loss from buying the stock. This is considered one of the most effective hedging strategies.

Investors seeking to hedge an individual stock with reasonable liquidity can often buy put options to protect against the risk of a downside move. Puts gain value as the price of the underlying security goes down. The main drawback of this approach is the premium amount to purchase the put options. Bought options are subject to time decay and lose value as they move toward expiration. Vertical put spreads can reduce the premium amounts spent, but they limit the amount of protection. This strategy only protects an individual stock, and investors with diversified holdings cannot afford to hedge each position.

Investors who want to hedge a larger, diversified portfolio of stocks can use index options. Index options track larger stock market indexes, such as the S&P 500 and Nasdaq. These broad-based indexes cover many sectors and are good measures of the overall economy. Stocks have a tendency to be correlated; they generally move in the same direction, especially during times of higher volatility. Investors can hedge with put options on the indexes to minimize their risk. Bear put spreads are a possible strategy to minimize risk. Although this protection still costs the investor money, index put options protect a larger number of sectors and companies.

(vi) Volatility Index Indicator: Investors can also hedge using the volatility index (VIX) indicator. The VIX measures the implied volatility of at-the-moneycalls and puts on the S&P 500 index. It is often called the fear gauge, as the VIX rises during periods of increased volatility. Generally, a level below 20 indicates low volatility, while a level of 30 is very volatile. There are exchange-traded funds (ETFs) that track the VIX. Investors can use ETF shares or options to go long on the VIX as a volatility-specific hedge.

2.3. Hedging Strategies and Performance of Manufacturing Companies in Nigeria

For manufacturing companies in Nigeria to boost their financial performance, they need to adopt the following hedging strategies. These strategies will help in their operations, especially during purchase of raw materials and other contractual operations, from local companies and most importantly foreign companies;

- a) **Contractual Risk-Sharing:** The first hedging strategy is called contractual risk-sharing. This method of hedging is adopted when a company signs a contract with an international company. This strategy will help manufacturing companies in Nigeria sign contracts for exchange rates. The contract sets boundaries for the exchange rates and reduces the risk for both parties. In this context, the construction of the contract will be fair and reasonable.
- b) **Contractual Approaches:** In this case, the company uses a long-term currency option to hedge the exchange risk. This proceeding is prohibitively expensive, because long-term options are composite short-term options, so the company has to buy various options. Another disadvantage is the uncertainty about changes in competitiveness, this could change every day and is hard to hedge.
- c) **Back-to-Back Loans:** This type of strategy includes two parties again; a company finances their foreign operations in a local currency. The goal in this scenario is to find a similar firm which is in the same situation. If this is possible, each firm will take out a loan and both firms will swap their loans for a given period of time. The basic of the method is to reduce the foreign exchange risk.
- d) **Currency Swaps:** A further hedging strategy is called currency swaps. In this method, the firm switches the denomination of outstanding loans. The company looks for a partner in the foreign country in the same situation that is capable of borrowing in foreign currency with lower costs.
- e) **Natural Hedging:** Also known as Matching Currency Cash Flows – this proceeding is much different to the other strategies. In this scenario, no financial products or partners in foreign countries will be needed anymore. The principle of this concept is easy, the company receives cash inflows in a defined currency (for example dollar \$) and finances their operations in the same currency. It is important that the cash inflows are perfectly matched with dollar

outflows in time and volume. So the company is not dependent about fluctuation of prices anymore.

2.4. Determinants of Hedging Strategies

(i) Foreign Exchange Exposure: When companies have revenues or expenditures in a currency different from the reporting currency in the annual report future cash flow will be affected due to variation in exchange rates. This is probably the most straightforward determinant of hedging and has been identified in relationship with the use of currency derivative in numerous previous studies. Alyannis and Ofek (2001) found in research of 500 U.S. companies that there was a link between the use of currency derivatives and FX exposure. Nydahl (1999) made a study on Swedish firms and found evidence that FX exposure increased with the fraction of sales classified as foreign. Also, Hagelin (2001) found evidence from the Swedish market that companies use currency derivatives to hedge transaction exposure in order to reduce the indirect costs of financial distress or alleviating the underinvestment problem, but there was no evidence found to support that hedging translation exposure was value creating. In this study, foreign exchange determinant is one of the variables used. This was determined by the difference between the official exchange rate of the Naira to the US\$ and the effective exchange rate in the same period. This is referred to as the foreign currency hedging.

(ii) Interest Rate: This is associated with high financial leverage combined with volatile firm value increases the expectations of financial distress, which might give risk-averse managers an incentive to turn down positive present value investments (Myers, 1977). A high leverage would also implicitly mean high amount of interest payment that the firm value, and would be more volatile and risk-reward benefits would be demanded by investors (Smith and Stulz, 1985). Therefore, there could be incentives to hedge and the use of financial derivatives should be positively related to an increase in leverage. Previous studies have shown no relationship of the use of interest rate derivatives and leverage, but there have been found evidence with interest rate derivatives and leverage. (Hagelin, 2001). Haushalter (2000) found evidence that total debt ratio is positively related to the percentage of production hedged, consistent with theories on transaction cost of financial distress. Interest rate fluctuations cause leverage problems for the firm; hence it is used as the second proxy for the determinant of hedging strategies in his study.

(v) Liquidity: When a firm has low liquidity and its cash flow is very volatile, there is a possibility that the firm would not be able to meet the

obligations of payment and there would be an increase in the probability of financial distress. Thus, firms with low liquidity have incentives to hedge (Mayers & Smith, 1982).

2.5. Theoretical Framework

The Arbitrage Pricing Theory (APT) is a theory of asset pricing that holds that an asset's returns can be forecasted with the linear relationship of an asset's expected returns and the macroeconomic factors that affect the asset's risk. The theory was created in 1976 by American economist, Stephen Ross. The Arbitrage Pricing Theory (APT) offers analysts and investors a multi-factor pricing model for securities, based on the relationship between a financial asset's expected return and its risks. The arbitrage pricing theory (APT) states that the expected return of financial asset can be modeled as a linear function of macroeconomic factors (Bae, Kim and Kwon, 2018). Under this framework, if, for example, FX rate is one of those factors, hedging policy can affect expected stock returns. This theory captures the determinants of hedging as the factors that underline the value of an asset. At the same time, these factors provide the risks associated with the same financial asset. These can lead to hedging which is the focus of this study. Interest rate and exchange rate are important factors considered in the Arbitrage Pricing Factor (APT). These are the major variables in this study; hence the theory is relevant to this study.

2.6. Empirical Review

Hosama and Setyaman (2022) examined the determinants of hedging decisions in state-owned and private manufacturing firms on the IDX. Based on previous research by Mediana and Muharam (2016), several determinants factors of hedging decisions were identified, namely liquidity, leverage, firm size, profitability and public ownership. The analytical method used was logistic regression analysis using a sample of 175 state-owned and private manufacturing firms from 2018-2020. The results of the analysis showed that only liquidity and firm size have a significant influence on hedging decisions, which are negative and positive, respectively. The researchers stated that the implication that can be taken was that when the firm makes a hedging decision, the firm needs to reduce liquidity or invest in working capital. On the other hand, the firm needs to increase firm size through its fixed asset investment activities.

Seok, Kim, Cho and Kim (2020) investigated the determinants of hedging with derivatives and its effect on firm value and firm risk for Korean firms. The researchers used a two-stage analysis by using gains and losses from

derivatives as instrument variable for hedging with derivatives. From the analysis on the determinants of hedging, it was showed that firms that are more leveraged and less profitable, and with more growth opportunities are likely to hedge through derivatives. Additionally, large firms, firms less diversified into industry, and firms more diversified geographically are likely to use derivatives. The two-stage analysis showed that indicators of hedging with derivatives have an insignificant effect on firm value, and the indicator of futures/forwards use and of swaps use have significant negative effect on firm value. Whereas, the extent of hedging with derivatives has positive effect on firm value for all types of foreign currency derivatives, which suggests that moderately low hedgers use derivatives inefficiently, but extensive hedgers use derivatives properly. The researchers concluded that Korean firms use derivatives to manage operational volatility rather than to manage market risk, and accounting-based risk reduction through hedging is not directly translated into higher firm value

Huang (2015) investigated the determinants of corporate hedging by using a comprehensive dataset of US and UK non-financial firms. The two countries were of particular research interest since they have almost similar legal system for the conduct of business and their market-based financial systems and equity markets were well developed with good investor protection. From the empirical results it was showed that corporate hedging decision is closely associated with firms' financial characteristics and the strength of their corporate governance. The researcher reported that hedgers tended to be high-rated firms and larger firms which have a cost advantage in hedging due to economies of scale. This finding provided an explanation of why the small firms, which have more volatile cash flows, higher costs of bankruptcy, more growth opportunities, tend not to engage in hedging. Hedging is more costly for small firms; so they have different hedging policies and respond differently to hedging.

3. METHODOLOGY

The research design adopted for this study is the *Ex-post facto* research design. This design was considered suitable because it supports the use of existing numerical data collected on the stated dependent and independent variables in the study to evaluate the research questions and hypotheses in the study. Furthermore, the choice of the research design is justified since it supports the main focus of this study which is the examination of the evaluation of determinants of firms' hedging strategies and performance of manufacturing companies in Nigeria from the year 1990 to 2021, of which the data required for this would exist in secondary form or time series form. Finally, the adopted research design also supports the use of various

quantitative methods including statistical techniques required in the treatment of the collected research data for the purpose of answering the research questions, testing the research hypotheses in this study and arriving at relevant conclusions, that helps in the achievement of the research objectives as earlier stated. The research setting is the manufacturing sector in Nigeria with particular emphasis on the effect of currency hedging and interest hedging on manufacturing capacity utilisation from 1990 to 2021.

3.1. Nature and Sources of Data

The data used in this study are secondary data. These data were sourced from the Financial and External Sector Statistics section of the Central Bank of Nigeria (CBN) Statistical Bulletin of various years, and the socio-economic Report from the National Bureau of Statistics (NBS) (various years).

3.2. Model Specification

Linear regression models were used in depicting the impact on the effects of the determinants of hedging strategies on the performance of manufacturing sector in Nigeria from 1990 to 2021. This is shown in the equations below:

$$\text{MCUT} = f(\text{IRHG}, \text{CRHG}) \quad \text{Equation 1}$$

$$\text{MCUT} = \alpha_0 + \beta_1 \text{IRHG} + e_1 \quad \text{Equation 2}$$

$$\text{MCUT} = \alpha_0 + \beta_2 \text{CRHG} + e_1 \quad \text{Equation 3}$$

$$\text{MCUT} = \alpha_0 + \beta_1 \text{IRHG} + \beta_2 \text{CRHG} + \epsilon_1 \quad \text{Equation 4}$$

Where:

MCUT is the Manufacturing sector average capacity utilisation (dependent variable)

IRHG is Interest Rate Hedging (independent variable)

CRHG is Currency Hedging (independent variable)

α_0 is the regression intercept or constant

$\beta_1 \beta_2$ are the estimated regression coefficients or slopes of the regression line

ϵ_1 is the error term

3.3. Data Analysis Technique

Descriptive and inferential statistical techniques were used in the analysis of the data collected in this study. This was to ensure that the data collected

were properly and exhaustively analyzed to achieve the objectives of this study through filing out the nature and direction of the effect of the determination of hedging strategies on the performance of the manufacturing sector in Nigeria. In addition to the descriptive statistic techniques used, multiple regression technique was used to evaluate the nature of the relationship between the dependent variable and independent variables in this study. In using the multiple regression, statistics such as Coefficient of Determination (R^2) was used in determining the predictive power of the independent variables in explaining changes in variables of economic growth in Nigeria from the year 1990 to 2021. In addition, t-statistic technique was used in testing the statistical significance of these independent variables in relation to the dependent variable, real Gross Domestic Product (GDP). Finally, F-statistic values were used to test the null hypotheses in the study. These tests were conducted at 95% significance level.

4. ANALYSIS AND DISCUSSION

The data for determinants of hedging strategies and the performance of manufacturing sector in Nigeria from 1990 to 2021 is presented in Table 1. This data comprised of interest rate hedging (IRHG), currency hedging (CRHG) (independent variables) and average manufacturing capacity utilisation (dependent variable) from 1990 to 2021.

Table 1: Data on Interest Rate Hedging (IRHG), Currency Rate Hedging (CRHG) and Average Manufacturing Capacity Utilization (1990-2021)

YEAR	CRHG	IRHG	MCUT
1990	-0.03	2.20	40.35
1991	-0.41	0.79	42.00
1992	-0.10	1.40	38.07
1993	-0.55	17.77	51.89
1994	-0.66	0.00	30.40
1995	-0.86	0.61	33.63
1996	-0.63	1.12	38.70
1997	-0.24	9.77	32.52
1998	1.92	3.05	32.52
1999	-0.35	5.87	31.29
2000	-0.33	3.57	32.99
2001	-0.46	3.05	42.70
2002	-0.32	5.34	45.48
2003	-0.13	2.17	45.34
2004	-0.50	1.64	45.00
2005	-1.05	1.54	47.74

contd. table 1

YEAR	CRHG	IRHG	MCUT
2006	-0.51	1.44	48.56
2007	-0.77	1.43	62.04
2008	-0.78	3.56	53.84
2009	-1.61	3.63	55.14
2010	-1.99	4.92	56.22
2011	-2.03	6.39	57.51
2012	-2.05	7.00	56.32
2013	-2.06	7.97	52.30
2014	-2.07	9.20	56.35
2015	-1.48	9.86	54.71
2016	-0.40	10.42	53.82
2017	-0.50	13.05	50.20
2018	-0.50	8.83	52.70
2019	-0.50	15.04	53.50
2020	-0.50	16.32	55.80
2021	2.02	16.57	54.50

Source: CBN (2021), National Bureau of Statistics (NBS) (various years)

4.1. Trend Analysis

To achieve objective one, an examination of the trend of interest rate hedging and currency hedging as determinants of hedging strategies from 1990 to 2021 was carried out as shown in Figure 1.

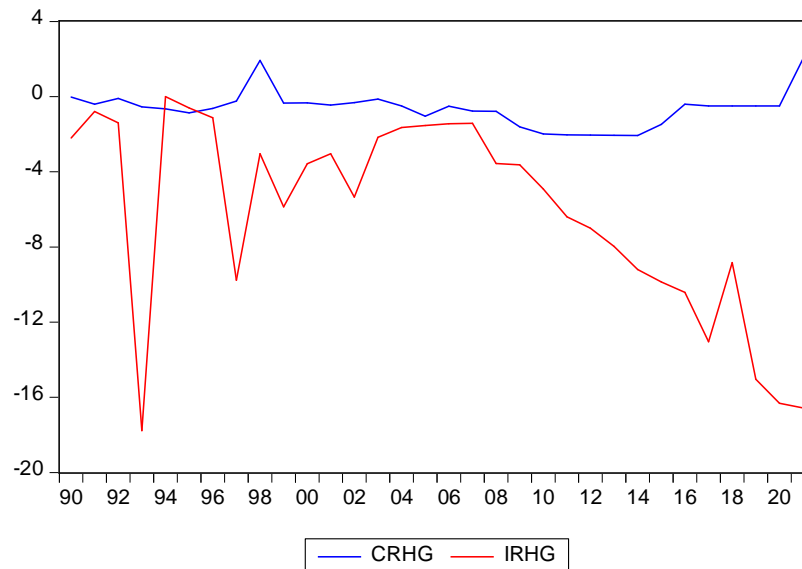


Figure 1: Trend of Interest Rate Hedging (IRHG) and Currency Hedging in Nigeria from 1990 to 2021

Figure 1 shows that the Interest Rate Hedging (IRHG) and Currency Hedging in Nigeria from 1990 to 2021 indicates the extent of the hedging strategies in the Nigerian economy. The interest rate heading shows the extent of the fluctuations in interest rate regime in Nigeria. This implies that there is the possibility of the use of loans swap or even futures by many manufacturing firms in Nigeria. By this, these manufacturing firms manage and avoid interest rate risk. Also, use of currency hedging has shown that there is less use of currency hedging, in the form of currency swaps. This could be related to the fact that currency swap is not available for the major import currencies such as the United States Dollars, European Union Euros, and Great Britain's Pound Sterling. The only available currency swap to many manufacturers in Nigeria is with the Chinese Renminbi or Yuan.

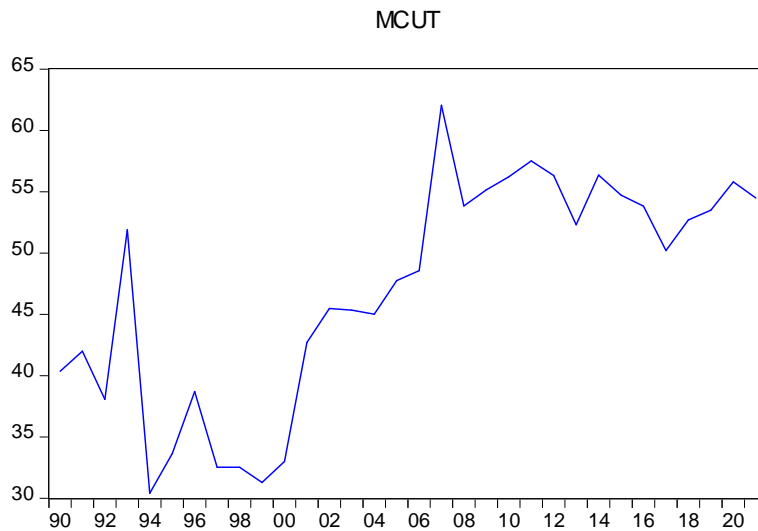


Figure 2: Trend of Average Manufacturing Capacity Utilisation (1990-2021)

On the performance of the manufacturing sector in Nigeria, the average manufacturing capacity utilisation was used. Figure 2 show that the trend of the average manufacturing capacity utilisation is unstable, indicating unstable performance of the manufacturing sector in Nigeria. This is usually associated with economic distortions that pervade the country, which has contributed to lower output of the manufacturing sector in the economy. These factors have been shown to include poor infrastructure, epileptic power supply, insecurity, and other economic policies that pertain to inflation managing, exchange rate management, and availability of credit in the sector.

4.2. Test of Hypothesis

The hypotheses of the study are tested in this section:

Hypothesis 1: Interest rate hedging does not have significant effect on average manufacturing capacity utilization in Nigeria from 1990 – 2021.

The result of the regression analysis is evaluated as follows:

$$\text{MCUT} = 42.14004 - 0.7960961\text{RHG} + 0.289256$$

$$t = 18.25610 - 2.752219$$

$$p\text{-value} = 0.0099 < 0.05$$

$$F\text{-ratio} = 7.5747, \quad P\text{-value (F-ratio)} = 0.0099.$$

$$R^2 = 0.201591 (20\%); \quad \text{Adj. } R^2 = 0.174977$$

From the regression output, interest rate hedging had a negative and statistically significant influence on average manufacturing capacity utilization during the period of the study. This is premised on the fact that p-value $0.0099 < 0.05$, the beta coefficient is -0.7960961 and t-stat of -2.752219 .

The coefficient of determination (R^2) shows that about 20% of variation in MCUT is caused by IRHG while 80% variation is accounted for by variables not captured in the model but accounted by the stochastic error term. The F-ratio of 7.5747 with P-value of 0.0099 indicates that the model is suitable for policy formulation.

Hypothesis 2: Foreign currency hedging does not significant influence average manufacturing utilization in Nigeria from 1990 – 2021.

The result of the regression analysis is evaluated as follows:

$$\text{MCUT} = 44.30754 - 4.228522\text{CRHG} + 1.537336$$

$$t \text{ stat} = 24.21031 - 2.582561$$

$$p\text{-value} = 0.0149 > 0.05$$

$$R^2 = 0.181884 (18.18\%); \quad \text{Adj. } R^2 = 0.154614 (15.46\%)$$

$$F\text{-stat.} = 6.669623; \quad P\text{-Value} = 0.014930$$

From the result, the beta coefficient is -4.228522 , t-stat -2.583 , p-value $0.0149 > 0.05$. This implies that foreign currency hedging has a negative influence on average manufacturing capacity utilization during the period of the study. This is because the p-value of 0.0149 is greater than 0.05 level of significance. The coefficient of determination (R^2) is 18.18% which explains that variation in the dependent variable was accounted for by this

variable to that extent, while 91.82% is accounted for by variables not captured in the model but represented by the stochastic error term. The F-ratio of 6.6696 shows the model was robust, but statistically not significant.

Hypothesis 3: This hypothesis states that there is no significant effect of interest rate and foreign currency hedging on average manufacturing capacity utilisation in Nigeria.

Regression Results for Hypothesis H₀₃

$$\text{MCUT} = 38.749 - 0.867\text{IRHG} - 4.641\text{CRHG}$$

$$t\text{-stat} = (17.210) \ (-3.441) \ (-3.295)$$

$$\text{S.E.} = (2.251) \ (0.252) \ (1.408)$$

$$\text{Prob.} = (0.000) \ (0.0018) \ (0.0026)$$

$$R^2 = 0.4191$$

$$\text{Adjusted } R^2 = 0.3790$$

$$F\text{-stat} = 10.4595$$

$$\text{Prob. (F-stat)} = 0.0004$$

The result show that the performance of the manufacturing sector as indicated by Average Manufacturing Capacity Utilisation (MCUT) will remain positive at an average of 38.749% if interest rate hedging (IRHG) and currency hedging (CRHG) are held constant. Furthermore, a unit change in interest rate hedging will exert a 0.867% decrease in Average Manufacturing Capacity Utilisation (MCUT). This inverse relationship is shown to be statistically significant at 5% level of significance given that the computed t-statistic value obtained was -3.441 and the probability value was 0.0018. Based on the fact that the absolute of t-statistic value of 3.441 is greater than the critical t-statistic value of 1.697 ($t_{0.05, 30}$), and the probability value of 0.0018 is less than 0.05. Similarly, a unit increase in the level of currency hedging (CRHG) will lead to a 4.641% decrease in Average Manufacturing Capacity Utilisation (MCUT). This negative relationship is shown to be statistically significant at 5% level of significance given that the computed t-statistic value obtained was -3.295 and the probability value was 0.0026. Based on the fact that the absolute of t-statistic value of 3.295 is greater than the critical t-statistic value of 1.697 ($t_{0.05, 30}$), and the probability value of 0.0026 is less than 0.05.

Furthermore, the coefficient of determination (R^2) value of 0.4191 indicates that only 41.91% of the variations in Average Manufacturing Capacity Utilisation (MCUT) have been explained by interest rate hedging and currency hedging. Conversely, the remaining 58.09% of the variations in Average Manufacturing Capacity Utilisation (MCUT) would be accounted for by other variables not considered in the research model in this study. Finally, since the computed F-statistic value of 10.4595 returned a probability value of 0.0004, the model for the study can be said to have goodness-of-fit. This implies that since the probability value obtained is 0.004, which is less than 0.05, then the null hypothesis will fail to hold and is rejected. As such, the alternative hypothesis which states that interest rate hedging and currency hedging has a significant effect on Average Manufacturing Capacity Utilisation (MCUT) of the manufacturing sector in Nigeria.

4.3. Discussion of Findings

Both interest rate hedging and currency hedging showed negative effects on Average Manufacturing Capacity Utilisation (MCUT) in Nigeria within the period covered in this study. This indicates that increased use of interest rate hedging and currency hedging will decimate the gains made in Average Manufacturing Capacity Utilisation (MCUT). Also, a decrease in the use of interest rate and currency heading will lead to increase in Average Manufacturing Capacity Utilisation (MCUT). The implication here is that increase in the level of determinants of hedging strategies will have negative effect on the performance of manufacturing sector in Nigeria. This might be an indication that there may be inherent defects in the hedging strategies adopted by manufacturing firms, as well as the economic distortions that exists in the Nigerian economy. Another reason, that may lead to the negative effect of the interest rate hedging and currency hedging may also be the developing nature of the futures market in the country, with some of the basic regulations and infrastructures still lacking.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

This researcher was an evaluation of the determinants of hedging strategies and performance of the manufacturing firms in Nigeria. The objective was to determine the effect of interest rate hedging and currency hedging on Average Manufacturing Capacity Utilisation (MCUT) in the manufacturing sector in Nigeria from 1990 to 2021. Quantitative research design was adopted for the study, and data on the proxies for the dependent and independent variables were collected from the Central Bank of Nigeria

(CBN) Statistical Bulletin 2021, and the Socio-economic report by National Bureau of Statistics (NBS) (various years). The data was analysed using trend and multiple regression analysis. From the findings, it was revealed that interest rate hedging and currency hedging have inverse and statistically significant effect on Average Manufacturing Capacity Utilisation (MCUT) of the manufacturing sector in Nigeria. This means that the determinants of hedging strategies have significant effect on the performance of the manufacturing sector in Nigeria.

5.2. Recommendations

Based on this, the following are recommended:

- i) There is need for further regulation of interest rate in Nigeria. The free-market system has failed to support hedging strategies and there is need for an overhaul if hedging can be used to enhance improved performance of manufacturing firms.
- ii) Exchange rate management in the country should be improved upon. There is need to dedicate an exchange rate window to the manufacturing sector because of their foreign exchange needs to machineries and equipment. This will enhance foreign currency hedging, and invariably lead to better manufacturing sector performances.

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APPENDIX A

Dependent Variable: MCUT

Method: Least Squares

Date: 12/19/22 Time: 13:03

Sample: 1990 2021

Included observations: 32

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
C	38.74968	2.251531	17.21037	0.0000
IRHG	-0.866639	0.251868	-3.440851	0.0018
CRHG	-4.640481	1.408424	-3.294804	0.0026
R-squared	0.419058	Mean dependent var		47.00416
Adjusted R-squared	0.378993	S.D. dependent var		9.247146
S.E. of regression	7.287121	Akaike info criterion		6.899154
Sum squared resid	1539.962	Schwarz criterion		7.036567
Log likelihood	-107.3865	Hannan-Quinn criter.		6.944703
F-statistic	10.45946	Durbin-Watson stat		0.870337
Prob (F-statistic)	0.000380			

Dependent Variable: MCUT

Method: Least Squares

Date: 12/19/22 Time: 13:04

Sample: 1990 2021

Included observations: 32

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
C	42.14004	2.308271	18.25610	0.0000
IRHG	-0.796096	0.289256	-2.752219	0.0099
R-squared	0.201591	Mean dependent var		47.00416
Adjusted R-squared	0.174977	S.D. dependent var		9.247146
S.E. of regression	8.399255	Akaike info criterion		7.154625
Sum squared resid	2116.425	Schwarz criterion		7.246233
Log likelihood	-112.4740	Hannan-Quinn criter.		7.184990
F-statistic	7.574708	Durbin-Watson stat		0.408216
Prob (F-statistic)	0.009946			

Dependent Variable: MCUT

Method: Least Squares

Date: 12/19/22 Time: 13:05

Sample: 1990 2021

Included observations: 32

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
C	44.30754	1.830111	24.21031	0.0000
CRHG	-4.228522	1.637336	-2.582561	0.0149
R-squared	0.181884	Mean dependent var		47.00416
Adjusted R-squared	0.154614	S.D. dependent var		9.247146
S.E. of regression	8.502279	Akaike info criterion		7.179007
Sum squared resid	2168.663	Schwarz criterion		7.270616
Log likelihood	-112.8641	Hannan-Quinn criter.		7.209373
F-statistic	6.669623	Durbin-Watson stat		0.644549
Prob (F-statistic)	0.014930			