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Foreign Exchange Fluctuation and Performance of Manufacturing Companies in Nigeria (1986-2017)

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Abstract
This paper investigates the impact of foreign exchange fluctuations on the manufacturing industry in Nigeria. The main objective of this study is to evaluate the impact of foreign exchange fluctuations on the manufacturing industry in Nigeria. Secondary data was used for the study. The population of the study consist of manufacturing companies in Nigeria from 1986-2017. The data was analyzed using ordinary least regression analysis. From the analysis of variables controlled, three showed positive relationship (foreign exchange rate=33.96, import=0.860, export=0.383), two showed negative relationship (inflation= -58.35, lending rate= -269) with manufacturing outputs. Out of the variables mentioned above, only lending rate did not have significant relationship (P>0.05). The result also showed significant relationship of foreign exchange fluctuations with economic growth (400).Foreign exchange rates have positive significantly effect on the output of manufacturing industry (β= 33.96,t=10.17, P< 0.05, Adj R^2 = 0.768). There is a negative significant relationship between inflation and the performance/outputs of the manufacturing industry (β=-58.35, t=-2.079, P< 0.046, AdjR^2= 0.097).Also, there is a positive significant relationship between import and outputs of manufacturing industry (β=0.860, t=12.655, P<0.05, Adj R^2= 0.837). Export has a positive significant relationship with manufacturing outputs (β=0.383, t= 7.263, P<0.05, Adj R^2 = 0.625). There is no significant relationship between lending rate and manufacturing outputs (β= -269.46, t = -02.03, P>0.05, Adj R^2=0.092). Foreign exchange rate fluctuation has a positive effect on economic growth (GDP). The study concluded that foreign exchange fluctuation will have a positive effect on the manufacturing industry and it will also affects economic growth positively. The study recommends that manufacturing companies should put in appropriate foreign exchange management policy, embark on backward integration and divest to exportation of their products.

Keywords*: Foreign Exchange Fluctuations, Inflation, Interest Rate, Export, Import, Economic Growth.*

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I. INTRODUCTION

The manufacturing companies play a catalyst roles in the development of economy of a nation. They are industries which involved in the manufacturing and processing of items and indulge in either creation of new commodities or in value creation. The final product can either serve as finished goods for sale to customers or as intermediate goods used in the production process. It is an avenue for increasing productivity in relation to import replacement and export expansion, creating foreign exchange capacity, raising employment and per capital incomewhich causes unrepeatable consumption patterns[1].

Manufacturing sector seems to always being a major contributor to gross domestic product in Nigeria. The sector is also likely to serve as one of the engine rooms of provision of employment for the populace through their value chain activities. The percentage of contribution of the sector to economic growth from 2007 to 2017 was 24.34%, 24.71%, 21.24%, 25.32%, 28.28%,27.07%, 25.74%, 24.64%, 20.16%, 18.17%, and 22.32%[2].The highest percentages was 28.28% in 2011 and 18.17% which is lowest in 2016[2].

However, the manufacturing sector in Nigeria is likely to beunder developed with very low level of capacity utilization and the sector may nothave been able to provide adequate employment for the nation. The

low output production and the low contribution of the sector to the Gross domestic product (GDP) may largely due to the exchange rate instability caused by the changing exchange rate policy implemented by the Nigerian government as at then. Manufacturing sector in Nigeria depends on the external sector for import of essential manufacturing inputs. The sector virtually depended on the imported raw materials for the production of their output[3].

The exchange rate deregulation was introduced in 1986 as a result of adoption of structural Adjustment Programme (SAP) by Federal Government of Nigeria. The programme was aimed at removing structural bottlenecks occasion by government controls with the knowledge of foreign exchange as a major of determinant in the efficient allocation and utilization of scarce resources to enhance the flow of capital into a country, stimulating domestic industrial production, promotion of export, favourable balance of payment, prices of goods and services, import structure, export earnings, government revenues, external reserves and ability of local manufacturers to compete with their foreign counterparts[4]. However, the programme led to unstable and rising trends in the general price level[5]. The naira was devalued which made the cost of importation to be on the higher side. Since that time, the value of naira to other currencies has been depreciating and the cost of importing raw materials has been skyrocketing. In order to stem this development and ensure a stable exchange rate, the monetary authority put in place a number of exchange rate policies[5].

However, very little achievement was made in stabilizing the rate of exchange. As a consequence, the problem of exchange rate fluctuations persisted throughout the study period. The impact of fluctuations in exchange rate on manufacturing output had not received adequate attention

Research Questions

The study provided answers to the following questions;

I. What extent does exchange rate fluctuations impact have on manufacturingoutput?
II. What extent does effect of exchange rate, inflation, interest rate, export, import have on the manufacturing outputs?
III. What is the effect of exchange rate fluctuations on the economic growth?

Objectives of the Study.

To achieve theobjective of foreign exchange fluctuations on the performance of manufacturing companies in Nigeria, the following specific objectives were considered, which were to;

I. examine the impact of exchange rate fluctuation on the performance of Manufacturing output in Nigeria.
II. Investigate the relationship between exchange rate, inflation, interest rate, import, export and performance of manufacturing industry in Nigeria.
III. Investigate the effect of exchange rate fluctuation on economic growth in Nigeria.

II. REVIEW OF RELATED LITERATURE

The study aims at examining the effect of foreign exchange fluctuations on the performance of the manufacturing industry in Nigeria

Concepts Review- Exchange Rate

The exchange rate is the price of one currency in terms of another currency, that is, the current market price for which one national currency can be exchanged for another [1]. It normally expressed as the number of units of a domestic currency that will purchase one unit of a foreign currency or the number of units of a foreign currency that will purchase one unit of a domestic currency. For example the naira per United States (US) dollar (N/US$) or US dollars per naira (US$/N). If 1 US Dollar can be exchanged for N360, then one naira can be exchanged for US$0.0028.

The exchange rate plays a critical role in an economy because imports and exports constitute a large part of the economy. Essentially, exchange rate changes affect the price of imported goods, services and our exports. When the value of a currency, for example the naira falls, imported goods become more expensive, and we tend to reduce the volume of our imports. At the same time, other countries will pay less for some of our products that are exported and that will tend to boost export sales and foreign exchange earnings as well as the country's export industries competitiveness in the international markets. On the other hand, a higher exchange rate makes it harder to sell overseas as other countries exports become cheaper than that of Nigeria. This will lead to a fall in exports which will eventually reduce real national output and cut back employment level. In this regard we can say the Nigerian economy is less competitive. Also, exchange rate changes can affect foreign investments held by individual investors. For a Nigerian investor owning US investments, a strengthening of the Nigerian Naira relative to the US dollar 2 tends to reduce the value of the US investments as the US value of the securities becomes fewer in naira term. In Nigeria, the central bank maintains the stability of the Naira exchange rate in order to achieve its objective of maintaining price stability because domestic prices (inflation and interest

rates) are very responsive to exchange rate fluctuations. There are two main types of exchange rates in Nigeria; official and market exchange rates. The official exchange rate is determined by the monetary authority/central bank, while the market exchange rate is basically determined by market forces of demand and supply. When the demand for foreign exchange exceeds supply, the value of the Naira will go up, and if exchange rate supply exceeds demand, the value of the Naira will go down[1].

End-Period Exchange Rate

The end-period exchange rate simply refers to the final exchange rate prevailing at a particular period. An end period exchange rate is the exchange rate ruling on the final working day of a given period. For instance, we can have weekly, monthly, quarterly and yearly end-period exchange rates depending on the frequency. In the case of yearly frequency, the last exchange rate at end-December would be taken as the end-period exchange rate. The end period exchange rates are usually applicable to stock variables, such as external reserves and financial assets[2].

Volatility of the exchange rate

The exchange rate changes very often; it moves from minute to minute, hour to hour and day to day under a floating exchange rate regime. When there are large swings in the exchange rate over a period of time, the exchange rate is considered volatile. Thus, exchange rate volatility is a measure of the degree or frequency by which the price of the foreign exchange changes over time[3]. The larger the magnitude of the price change, or the more speedily it changes over a period, the more volatile the exchange rate is. If the price increases or falls with very wide margins over a period, it shows that the exchange rate is unstable or volatile and the foreign exchange market is said to be experiencing volatility. Volatility causes panic in the foreign exchange market because the users and traders of foreign exchange are uncertain of what to expect in the market on a daily basis. Some of the users most affected by exchange rate volatility are investors and international traders. They could lose money if the exchange rate falls below their expectations. In either situation, the monetary authority or central bank can intervene to control exchange rate volatility and avoid panic in the foreign exchange market. Conversely, investor stands to gain if the exchange rate is above their expectation[3].

Factors Responsible For Exchange Rate Movements

Movements in exchange rate are not only determined by the forces of demand and supply, but also by the wellbeing of the economy, particularly, in a floating exchange rate regime. In this regard, the amount of goods and services a country produces and sells (exports) to the rest of the world and the amount of foreign exchange earnings and level of external reserves are very important. Thus, where a country exports exceeds its imports, the country earns more foreign exchange and increases its external reserves. The rise in external reserves makes the domestic currency to appreciate and stronger in value. However, when a country's exports are less than imports, the country draws down on its foreign reserves to pay for the extra imports. This will cause the external reserves to reduce and if the trend persists, the domestic currency is likely to depreciate in value and becomes weaker[2].

Foreign Exchange Risk

Foreign exchange risk (also known as FX risk, exchange rate risk or currency risk) is a financial risk that exists when a financial transaction is denominated in a currency other than that of the base currency of the country[5]. The exchange risk arises when there is a risk of appreciation of the base currency in relation to the denominated currency or depreciation of the denominated currency in relation to the base currency. The risk is that there may be an adverse movement in the exchange rate of the denomination currency in relation to the base currency before the date when the transaction is completed[(6)(7)].

Foreign exchange risk also exists when the foreign subsidiary of a firm maintains financial statements in a currency other than the reporting currency of the consolidated entity.

Investors and businesses exporting or importing goods and services or making foreign investments have an exchange rate risk which can have severe financial consequences, but steps can be taken to manage, that is reduce the risk.[(8)(9)]

Hard Exchange Rate Peg (Fixed Exchange Rate Regime)

This is an exchange rate regime that takes away the power of independent domestic monetary policy from the central banks of the participating countries since its interest rates and exchange rate policies are tied to the country of the anchor-currency. Observed that hard pegs usually go hand in hand with sound fiscal and structural policies and low inflation

Empirical Literature on the impact of exchange rate devaluation on output and prices on countries

There is a vast body of empirical literature on the impacts of exchange rate devaluation on output and prices. In many of the existing studies, it has been recognized that the possible effects of devaluation on output could be contractionary. To this extent, several channels through which devaluation could be contractionary have been identified.

First, the author examined the impacts of devaluation on some macroeconomic variables in Argentina for the period 1955–61. He observed that devaluation was contractionary for Argentina because it induces a shift in income distribution towards savers, which in turn depresses consumption and real absorption. He equally observed that current account improved because of the fall in absorption relative to output.Twenty-four devaluation experiences were reviewed which involving nineteen different developing countries during the period 1959–66. The study showed that devaluation improved the trade balance of the devaluing country but that the economic activity often decreased in addition to an increase in inflation in the short term.

In a similar study, a log-linear macro model of an open economy for a sample of ten countries was constructed, using different estimates of the key parameters of the model. Their results showed that devaluation was expansionary in eight out of ten countries investigated. Devaluation was found to be contractionary in two countries (the United Kingdom and Brazil). The main feature of the studies reviewed above is that they were based on simulation analyses.

The few studies on contractionary devaluation based on regression analysis were done . In a pool-time series/ cross-country sample, the real GDP on nominal and real exchange rates, government spending, the terms of trade, and measures of money growth were regressed. He found that devaluation tended to reduce the output in the short term even where other factors remained constant. His results for the long-term effect of a real devaluation were more mixed; but as a whole it was suggested that the initial contractionary effect was not reversed subsequently[51]. In the same way, using a sample of twenty-three developing countries, regressed output growth on contemporaneous and lagged levels of the real exchange rate and on deviations of actual changes from expected ones in the real exchange rate, government spending, the money supply, and foreign income. The results showed that surprises in real exchange rate depreciation actually boosted output growth, but that depreciations of the level of the real exchange rate exerted a contractionary effect[6].

Theoretical Review-Theories of Exchange Rate Determination

There are five main theories of the determination of foreign exchange rate[5].

The Mint Parity Theory:

The earliest theory of foreign exchange has been the mint parity theory. This theory was applicable for those countries which had the same metallic standard (gold or silver). Under the gold standard, countries had their standard currency unit either of gold or it was freely convertible into gold of a given purity[5].

The Purchasing Power Parity Theory:

The purchasing power parity theory enunciates the determination of the rate of exchange between two inconvertible paper currencies. Although this theory can be traced back to Wheatley and Ricardo, yet the credit for developing it in a systematic way has gone to the Swedish economist Gustav Cassel[5].

Static Theory:

The PPP theory attempts to determine equilibrium rate of exchange under static conditions such as constancy of tastes and preferences, absence of capital movements, absence of transport costs, no changes in tariff, constant technology, absence of speculation etc. It is highly unrealistic to determine exchange rate with all these over-simplifying assumptions. In the actual dynamic realities, this theory fails altogether[5].

Inexact Theory:

PPP theory at best could serve as a crude approximation of the equilibrium rate of exchange. With its over-simplifying assumptions, it can neither exactly measure the rate of exchange nor can make a precise forecast of it over future period. Purchasing power parities cannot be used to compute equilibrium rates or to gauge with precision deviations from international payments equilibrium[5].

The Balance of Payments Theory:

The balance of payments theory of exchange rate maintains that rate of exchange of the currency of one country with the other is determined by the factors which are autonomous of internal price level and money supply. It emphasizes that the rate of exchange is influenced, in a significant way, by the balance of payments position of a country.

A deficit in the balance of payments of a country signifies a situation in which the demand for foreign exchange (currency) exceeds the supply of it at a given rate of exchange. The demand for foreign exchange arises from the demand for foreign goods and services. The supply of foreign exchange, on the contrary, arises from the supply of goods and services by the home country to the foreign country[5].

III. METHODOLOGY

Research Design

Based on the objectives of this work, the regression analysis of the Ordinary Least Square (OLS) was used to examine the exchange rate fluctuation on the performance of manufacturing industry in Nigeria and was also used to investigate others independent variables. Relevant data from records of National Bureau of Statistics (NBS) and Central Bank of Nigeria (CBN) over period 1986-2017 was tested to evaluate the relationship between the exchange rate fluctuations,inflation, export, import, lending rate,economic growth and performance of manufacturing industry in Nigeria.

Population of the Study

The population of this study consists of manufacturing companies in Nigeria over the period 1986 – 2017. The period was chosen because the exchange rate deregulation/intervention was introduced and the intervention still continued throughout the period and the data of outputs by manufacturing companieswere made available on consistence basis by National Bureau of Statistics (NBS) and Central Bank of Nigeria (CBN).

Sample and Sampling Technique

Somemanufacturing sectors were selected in a bid to have a wider representation of the manufacturing industry as being used in the computation of the Gross Domestic Products (GDP) .Attempt was made to cover virtually all the manufacturing companies as captured by National Bureau of Statistics (NBS) and Central Bank of Nigeria (CBN) for research period (1986-2017)

Model Specification

The ordinary least square (OLS) linear regression model was used to estimate the variables. This involves estimation of the model in order to examine the impact of exchange rates on manufacturing industry in Nigeria. The linear estimation technique aims at achieving unique parameter estimates that would enable us to interpret the regression coefficients and consequently give a slightly better fit. The study adopted an econometric model. The model is shown as:

$MO= a_o + \beta_1 FER + \beta_2 INF + \beta_3 IR + \beta_4 IMP + \beta_5 EXP + \mu$ .....(1)

Where;

MO: Manufacturing Output

a_o = a constant

β_1, β_2, β_3, β_4& β_5 = Regression slopes for the independent variables

FER= Foreign Exchange Rate

INF= Inflation

IR = Interest Rate

IMP = Import

EXP = Export

μ = an error term normally distributed about a mean of o. for the purpose of computation, the μ is assumed to be 0.

Method of Data collection

The data used for this study was the secondary data. The secondary data was collected from Central Bank of Nigeria (CBN), statistical bulletin, the annual report and statistical account, National Bureau of Statistics (NBS) publications and journals from the internet.

The data used for this study were Exchange Rate (EXR), Output of Manufacturing sector (OP), Interest Rate (IR),Import(IMP), Export (EXP),Inflation (INF) and Gross Domestic Product (GDP) for the period under review (1986-2017). Clearly, all these constitute secondary data. These data were sourced from the Central Bank of Nigeria (CBN) publications, National Bureau of Statistics (NBS) publications and journals from the internet.

A Priori Expectation

The apriori expectation of the relationship between independent variables and manufacturing outputs are as follows; exchange rate, inflation rate, lending rate and import are expected to have a negative and significant relationship with manufacturing outputs such that an increase in exchange rate, inflation rate, lending rate and import will lead to a reduction in manufacturing outputs while export is expected to have a positive and significant relationship with manufacturing output. Also foreign exchange rate is expected to have a negative and significant relationship with economic growth (GDP).

Method of Data Analysis

The study employed both descriptive and inferential statistics analyses to achieve the stated objectives. The descriptive statistics made useof bar charts, mean and standard deviation while inferential statistics used regression and analysis of variances (ANOVA).

The analysis of variance (ANOVA) was used to establish the differences in the variables collected using the secondary data available. There were variation in the said data especially with respect to dependent and independent variables respectively, hence an ANOVA was used at $\alpha = 0.05$

IV. RESULTS AND DISCUSSIONS OF FINDINGS

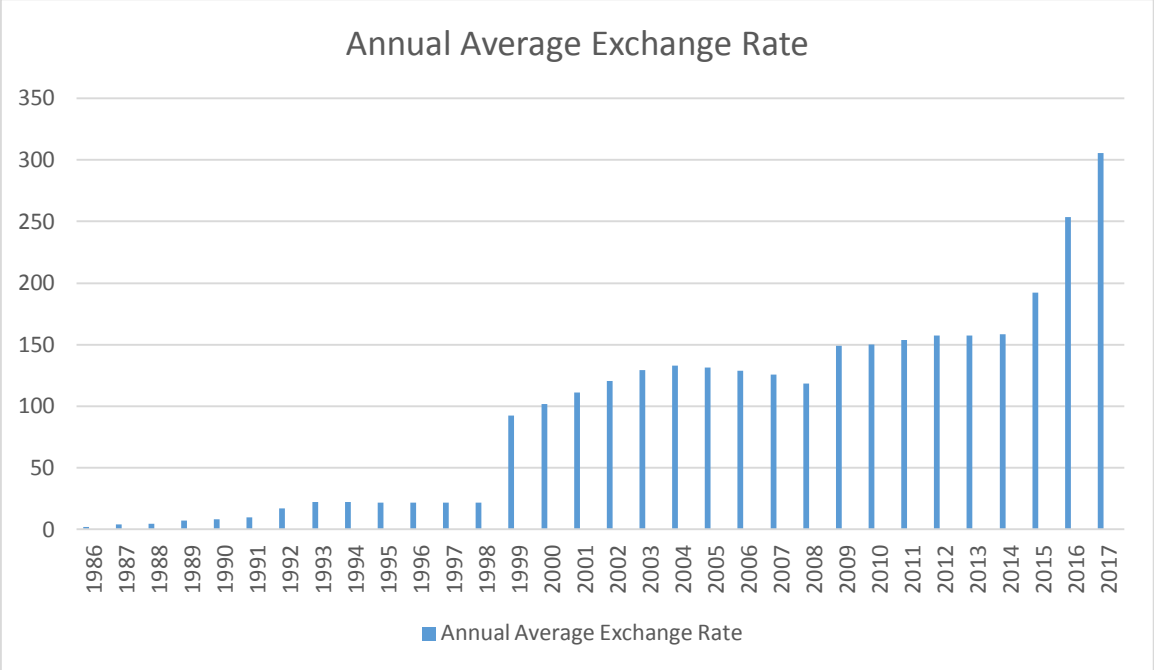
Presented below is the data and report of the estimation. The section discusses socio economic representation through descriptive analysis. It also examined the relationship among the relevant variables. The section also presents the evaluation of inferential statistics between exchange rate and manufacturing output as well as other variables with a view to identifying relationship or otherwise among the variables.

Presentation of Data

Table 4.1

Year	Annual Average Exchange Rate (N/$)	Annual Real Effective Exchange Rate index	Inflation	Interest Rate	Real Interest Rate
1986	1.8	267.64	5.7	9.93	-1.5
1987	4.0	85.27	11.3	13.96	-31.9
1988	4.5	85.68	54.5	16.62	-5.1
1989	7.4	76.30	50.5	20.44	-17
1990	8.0	70.79	7.4	25.3	14.6
1991	9.9	60.01	13.0	20.04	2.1
1992	17.3	49.78	44.6	24.76	-25.8
1993	22.1	54.54	57.2	31.65	4.4
1994	22.0	100.86	57.0	20.48	-8
1995	21.9	160.23	72.8	20.23	-43.6
1996	21.9	207.77	29.3	19.84	-9.7
1997	21.9	236.08	8.5	17.8	16.6
1998	21.9	272.52	10.0	18.18	25.3
1999	92.3	70.19	6.6	20.29	2.8
2000	101.7	69.91	6.9	21.27	-10.3
2001	111.2	77.88	18.9	23.44	23.8
2002	120.6	78.13	12.9	24.77	-10.8
2003	129.2	[73].25	14.0	20.71	8.6
2004	132.9	74.96	15.0	19.18	19.4
2005	131.3	85.55	17.9	17.95	-3.3
2006	128.7	91.50	8.2	16.9	-0.4
2007	125.8	89.65	5.4	16.94	11.6
2008	118.5	99.12	11.6	15.48	4.2
2009	148.9	92.14	11.5	18.36	23.7
2010	150.3	100.00	13.7	17.59	-42.3
2011	153.9	100.31	10.8	16.02	5.9
2012	157.5	111.39	12.23	16.79	6.9
2013	157.3	118.81	8.5	16.72	10.2
2014	158.6	127.09	8.1	16.55	11.4
2015	192.4	126.07	9.01	16.85	13.6
2016	253.5	115.68	15.7	16.87	6.7
2017	305.8	105.5	16.5	17.6	5.8

Source: Central bank of Nigeria/ National Bureau ofStatistics, 2020
Exchange Rate



Annual Average Exchange Rate
Source: Central bank of Nigeria, 2020

From figure 4.1 on the annual exchange rate. The exchange rate of naira to dollar was as low as N1.80/$ in 1986 but it depreciated to N22.10/$ in 1993 and became relatively stable from 1995 to 1998 at N21.9/$. The rate went up from N21.9/$ in 1998 to N92.3/$ in 1999 and reached N132.9/$ in 2004 and it came down to N118.5/$ in 2008. Since 2009 the rate has been rising from N148.9/$ year on year and this has continued to year 2017. In 2017 the rate risen to N305.8 form N 253.5 in 2016.(source from Central Bank of Nigeria)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.881[a]	.775	.768	1468.19774

a. Predictors: (Constant), Exchange Rate

b.

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	36247392.547	1	36247392.547	4.321	.046[b]
	Residual	251660571.075	30	8388685.703		
	Total	287907963.622	31			

a. Dependent Variable: Manufacturing Output

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	242473959.713	1	242473959.713	160.105	.000[b]
	Residual	45434003.909	30	1514466.797		
	Total	287907963.622	31			

a. Dependent Variable: Manufacturing Output
b. Predictors: (Constant), Import Value

V. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

Foreign exchange fluctuations have significant relationship on manufacturing outputs. Inflation have significant effect on manufacturing outputs. Imports have significant effect on manufacturing outputs.Exports have significant effect on manufacturing outputs. Foreignexchange fluctuations have significant effect on economic growth (GDP)

This paper explores the impact of foreign exchange fluctuation on outputs of manufacturing sector as well as the effect of lending interest rate, inflation, export and import on the manufacturing outputs in Nigeria. The effect of foreign exchange on economic growth was also examined. The study concludes that manufacturing companies are exposed to a turbulent business environment that makes planning for companies very difficult or impossible.

The following recommendations were made based on the findings of this study:

a. Manufacturing companies should put in appropriate foreign exchange rate management policy that will ensure effective stability in the foreign exchange rate/movement.

b. The manufacturing companies should diversify into exportation of their products to other countries thereby enable them to earn foreign exchange that will ultimately help them to minimize the effect of fluctuation on the performance of their companies.

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