Naira Free Fall and Industrial Production Index of Manufacturing Firms in Nigeria

Okeke, Salome Ogochukwu; Dr. Anastasia N. Duru; Oshim, Judethadeus C.

Department of Accountancy,

Faculty of Management Sciences,

Enugu State University of Science and Technology (ESUT), Agbani,

Enugu State, Nigeria.

Abstract

Research Purpose: Amid the depreciation and volatility of the Nigerian Naira, this study investigates its impact on the industrial production index of manufacturing firms in Nigeria. Given the reliance on imported inputs and machinery, understanding the extent of the Naira's free fall on manufacturing performance and competitiveness is critical.

Methodology: An ex-post-facto research design was employed, analysing 31 years of data (1990-2021) from the World Bank Database. The study utilised the Ordinary Least Square regression technique to test hypotheses related to exchange rate, purchasing power parity conversion factor, and price level ratio.

Findings: The study revealed that the official exchange rate has a significant negative effect on the industrial production index, while the purchasing power parity conversion factor has a significant positive effect. Additionally, the price level ratio shows a significant negative impact on the industrial production index.

Conclusion: The depreciation of the Naira adversely affects the industrial production index of manufacturing firms. The findings suggest that the Naira's free fall can be a predictor of manufacturing performance in Nigeria.

Recommendations: The government should implement a single exchange rate regime across all foreign exchange markets and local banks to ensure accurate estimation of exchange rate effects. Additionally, the Central Bank of Nigeria should enhance monetary and fiscal policies to increase the Naira's purchasing power and reduce the persistent rise in the price level of goods and services.

Key words: *Naira Free-fall, Exchange Rate, Purchasing Power Parity Conversion Factor, Price Level Ratio, Industrial Production Index.*

1. INTRODUCTION

1.1 Background of the Study

Industrial Production Index is an economic report that measures changes in output for the industrial sector of the economy (Ihejirika, 2012). The industrial sector includes manufacturing, mining, and utilities. Although these sectors contribute only a small portion of GDP (Gross Domestic Product), they are highly sensitive to interest rates and consumer demand. This makes the Industrial Production Index an important tool for forecasting future GDP and economic performance. Industrial Production figures are also used by central banks to measure inflation, as high levels of industrial production can lead to uncontrolled levels of consumption and rapid inflation (Ihejirika, 2012). The industrial production data is used in conjunction with various industry capacity estimates to calculate industrial production index ratios for each line of business, with a base year used as a benchmark level of 100%. Ihejirika (2012) further opined that the industrial production and industrial production index figures usually reflect similar changes in overall economic activity. Their monthly, quarterly or yearly levels can be used to shade light on short-term rates of change and business cycle growth respectively.

Industrial production index is the ratio of observed output to the designed output of the plant (Kang and Kim, 2015). It is the relative index, which provides the rating of the used capacity of the plant. If the value of this relative index is 60%, then it shows that only 60% of the whole capacity of the plant is going to be used and the rest 40% is waste. The industrial production index is having a pivotal role in the business success because it rates the overall capacity of the plant, which helps to measure productive efficiency and reduces the unit cost. The unit costs are reduced by the proper utilisation of available resources and machinery (Singh, Rathi and Garza-Reyes, 2021).

Several reasons have been documented on why a firm might experience low capacity utilisation. Among them are; new competitors taking market share or causing oversupply in the market and a fall in market demand arising from changes in consumer tastes or fashion. By identifying the internal and external factors affecting the level of a firm's actual and potential outputs, it becomes possible to shed clear light on how the economic conditions affect the firm's capacity utilisation. Therefore, this paper investigates the capacity utilisation rates at the firm level by considering the influence of exchange rate volatility, with particular mention to the recent free-fall of

the Naira viz a viz the US Dollar. Besides the firms' characteristics (age, size, ownership structure, industry, managerial experience, etc.), the going rate of the domestic currency could have several implications on the industrial production index rate of manufacturing firms, due to the effect it has on various inputs and the demand for outputs of these firms. Furthermore, the economic theory points to the fact that the likeliest cause of manufacturing capacity underutilization might come from demand slumps. A devalued exchange rate means higher prices for domestic products and the subsequent fall in their demand. The consequences of this on the part of business firms are cutting production quotas and a low rate of utilisation of existing productive capacity.

The relationship between currency devaluation and industrial production index needs further study. To comprehend the possible link between the industrial production index of Nigeria and the free fall of its currency, an understanding of devaluation and economic theory is needed. Devaluation is the purposeful decline of a currency's value relative to another foreign currency to boost exports by raising the price of foreign goods (Khan and Ali, 2016). The Naira's free-fall, despite several attempts to revive it, is attributable to a lack of efforts to improve the country's productive capacity. The naira's low productivity has caused it to lose value against the dollar in the parallel market (Usim, 2022). Ezie, Sualiman, and Abdelrasaq (2020) note that devaluation hasn't improved Nigeria's economic performance. Hence, the study ascertained the effect of naira free fall on the industrial production index in Nigeria.

1.2   Statement of the Problem

Industrialisation is a basic tool for attaining a desired level of economic growth and development by any nation. This is why countries across the world (including Nigeria) develop and implement policies on industrialisation. Nigeria is a developing economy with a low level of industrialisation and economic growth compared to advanced countries of the world like China, United States of America, Japan etc. The Nigerian government has rolled out several policies in the past to enhance the capacity of industries yet these firms have not lived to expectation. The poor industrial production index in Nigeria has been attributed to so many factors including capacity underutilisation; poor and decaying infrastructures; low level of technology; low investment; high cost of production; high rates of inflation; hostile investment climate; policy non-imple-mentation and reversals; lack of political

will to industrialise the economy; corruption, weak institutions; poor domestic linkages; general macroeco-nomic instability and lack of finance capital to build up production capacity in the various industries, among others.

However, the volatility of the Naira has been argued by economists and financial analysts as the major factor influencing industrial production output in Nigeria. High naira free falls in foreign exchange markets have a cascading impact on all economic operations, from importation to exporting to local goods prices. Devaluation raises the cost of raw materials and goods, which reduces demand. When demand drops, manufacturing firms suffer from rising raw material costs. These could be major concerns for manufacturing firms' productivity. The study examines the effect of naira-free fall on the industrial production index (measured by manufacturing value added) in Nigeria.

1.3   Objectives of the Study

The main objective of the study is to examine the effect of naira free fall on the industrial production index in Nigeria. The specific objectives are to:

i.   Ascertain the effect of the official exchange rate on the industrial production index of the manufacturing firms in Nigeria.

ii.   Investigate the effect of purchasing power parity conversion factor on the industrial production index of the manufacturing firms in Nigeria.

iii.   Evaluate the effect of price level ratio on the industrial production index of the manufacturing firms in Nigeria.

2.   REVIEW OF RELATED LITERATURE

2.1   Conceptual Review

2.1.1   Naira Devaluation

Devaluation is defined according to the 6th Oxford Advanced Learning Dictionary as the reduction in the value of the money of one country when it is exchanged for the money of another country. Devaluation of currency takes place when the currency value of a nation is deliberately adjusted in return for the currency of another country. Yioyio (2015) asserted that the devaluation of a nation's currency is a reduction in the value of money for those goods, services or other monetary units with which the currency of such a nation can be exchanged.

Exchange rate devaluation is the permitted decline in the value of the local currency relative to international currency, boosting exports by increasing the price of imported products and reducing export prices, leading to a favourable trade balance (Khan, Ali & Ali, 2016). Devaluing the exchange rate is expected to boost domestic production and incomes by increasing exports and reducing imports due to changes in terms of trade and price elasticity of demand (Kang, 2016). Like every other currency, the Naira can be depreciated utilising the above methods. With the steep depreciation of the Nigerian currency against the US Dollar, arguments have been made on how it affects Nigeria's economy. Such arguments include the idea that weakening the Naira will stimulate exports by making imports more expensive. Due to the Naira's low USD rate (Khan, et al. 2016).

2.1.2 Industrial Production Index

The index of industrial production is an economic tool that measures the changes in industrial activity in a country over a given period of time. In Nigeria, the index of industrial production measures the amount of output from manufacturing, mining and electricity. The contribution of this sector to gross domestic product is nothing to write home about. According to the Central Bank of Nigeria (CBN), industrial activities during the fourth quarter of 2015 indicated a decline, compared with the level in the preceding quarter. At 118.8 (2010 = 100), the estimated index of industrial production fell by 0.14% below the level in the preceding quarter, but showed a 19.2% increase above the level in the corresponding period of 2014. The decrease relative to the preceding quarter was attributed to fall in activities in the manufacturing and mining subsectors.

Nigeria needs to adopt an export oriented industrialisation policy coupled with import restriction as a way of reducing it dependent on importation from other countries of the world for her needs. This would lead to economic growth and development and reduce the magnitude impact associated with variations in primary product pricing. Industrialisation policy by mission, is supposed to create employment, reduce the level of poverty by reducing the gap between the rich and the poor, improve social equality and transformation which in turn results in economic development. The influential factor for the level of economic growth in the United States of America, China, Japan, Malaysia and other advanced countries of the world is tied to industrial production.

2.1.3   Exchange Rate

This is the rate at which a local currency is exchanged for a foreign currency; it is otherwise regarded as a foreign exchange rate and is usually stated as the amount of a local currency that will exchange for a unit of foreign currency (Dung and Okereke, 2022). Once the exchange rate of a currency has been fixed, the rate will be maintained all over the world through arbitrage. An exchange rate of N100 to one Euro in Nigeria is equivalent to 0.01 Euro to one naira in Germany. If the exchange rate is N150 to a Euro in Nigeria and 0.01Euro to the Naira in Germany, arbitrageurs will buy Euro in Germany to sell in Nigeria and realise N50 on every Euro sold, the increased supply of Euro in Nigeria will cause Naira to appreciate and the equality will be restored. The reduction of the exchange rate of the Naira to the Euro refers to the appreciation of the Naira and depreciation of the Euro while the increase in the foreign exchange rate of the naira to the Euro means the depreciation of the naira and appreciation of the Euro.

2.1.4   Purchasing Power Parity

Purchasing power parity (PPP) is the measurement of prices in different countries that uses the prices of specific goods to compare the absolute purchasing power of the countries' currencies, and, to some extent, their people's living standards. In many cases, PPP produces an inflation rate equal to the price of the basket of goods at one location divided by the price of the basket of goods at a different location. The PPP inflation and exchange rate may differ from the market exchange rate because of tariffs, and other transaction costs (Kadochnikov, 2013). The Purchasing Power Parity indicator can be used to compare economies regarding their Gross Domestic Product, labour productivity, and actual individual consumption, and in some cases to analyse price convergence and to compare the cost of living between places (Organisation for Economic Co-operation and Development (OECD), 2022). The calculation of the PPP, according to the OECD, is made through a basket of goods that contains a "final product list which covers around 3,000 consumer goods and services, 30 occupations in government, 200 types of equipment goods and about 15 construction projects" (OECD, 2022).

2.1.5   Price Level Ratio

The price level ratio is the ratio of a purchasing power parity (PPP) conversion factor to an exchange rate. It provides a measure of the differences in price levels between countries by indicating the number of units of the common currency needed to buy

the same volume of the aggregation level in each country (World Bank, 2022). Purchasing power parities (PPPs) are the rates of currency conversion that try to equalise the purchasing power of different currencies, by eliminating the differences in price levels between countries (OECD, 2022).

2.2 Theoretical Framework

The study is anchored on The Purchasing Power Parity (PPP) Theory propounded by Gustav Cassel in 1916.

The theory aims to determine the adjustments needed to be made in the exchange rates of two currencies to make them at par with the purchasing power of each other. In other words, the expenditure on a similar commodity must be the same in both currencies when accounted for the exchange rate. The purchasing power of each currency is determined in the process. A unit of any currency should be able to buy the same amount of goods in all nations, according to PPP. Many economists believe PPP describes long-term exchange rate forces (Sulaiman, et al. 2020). The nominal exchange rate between two countries' currencies must reflect their prices. According to PPP, the exchange rate of the two countries' currencies and their relative inflation rates are proportionate. In the absence of trade barriers and transportation costs, spatial commodity arbitrage equalises the price of any goods across countries. PPP can be formulated in absolute forms. Absolute PPP states that the equilibrium exchange rate equalises a given income's purchasing power in terms of relative prices. It links exchange rates to compare pricing. The relative form says exchange rate changes from a base period represent relative price changes.

Assumptions of Purchasing Power Parity Theory

One popular macroeconomic analysis metric to compare economic productivity and standards of living between countries is purchasing power parity (PPP). PPP is an economic theory that compares different countries' currencies through a "basket of goods" approach. According to this theory, two currencies are in equilibrium (known as the currencies being at par) when a basket of goods is priced the same in both countries, taking into account the exchange rates.

This study on Naira devaluation can be linked to the theory because of the big difference between the purchasing power of the naira against the US Dollar. What $100 can buy in Nigeria is worth ₦75,000 in the same market. Hence, the study is

anchored on this theory because it is the most suitable theory to explain the naira free fall in the parallel exchange market.

2.3 Empirical Review

Given the obvious importance of industrial production index in the overall resource-use efficiency of an economy, several studies have tried to examine its trends, determinants, and impacts on some macroeconomic variables.

Falaye, Eseyin, Otekunrin, and Asamu (2019) examined the impact of exchange rates on the performance of the Nigerian manufacturing sector over 25 years (1990-2014). Unit Root test, Johansen cointegration test, Granger causality test, and Error Correction Model were used for analysis. The results of the study show that a devaluation of the Naira has a negative impact on the performance of the Nigerian manufacturing sector as it was found that exchange rates have a negative significant relationship, long-run relationship, and causal relationship with the performance of the sector.

Zhang (2020) examined the link between credit constraints and industrial production index and whether it varies across manufacturing subsectors. The sample consists of 4,790 private manufacturing firms in six Latin-American countries. The counterfactual analysis based on the estimation results suggests that credit constraints generally affect medium-high-tech firms more severely than low-tech firms. The counterfactual analysis further reveals that, for credit-constrained high-technology firms, depressed outputs are primarily related to labour productivity rather than capital productivity.

Ezie, Sulaiman, and Abdelrasaq (2020) examined the impact of exchange rates on the performance of the manufacturing sector in Nigeria between 1986 and 2014 using the Ordinary least square (OLS) regression method. Pre-estimation diagnostics test revealed that the variables were stationary at the first difference and they all have long-run equilibrium relationships among them. Findings from the study revealed that there is a significant relationship between exchange rates and manufacturing outputs in Nigeria.

Okunade (2020) examined the effect of capacity utilisation on manufacturing firms' output in Nigeria using time series data covering the period of 1981 to 2016 through an Autoregressive Distributed Lag (ARDL) model approach. The study found a positive but insignificant relationship between capacity utilisation and manufacturing firms'

output since the capacity was grossly underutilised in virtually every productive firm in Nigeria.

Mlambo (2020) examined the impact of the exchange rate on manufacturing performance in Southern African Customs Union (SACU) states. Manufacturing in Southern African Customs Union (SACU) countries is hampered by structural shortcomings such as the exchange rate and other factors. Given this background, the study employed the panel group FMOLS and PMG approaches for the period 1995–2016. Results showed that the exchange rate, imports, and FDI have a negative relationship with manufacturing performance. Exports and inflation had a positive relationship with manufacturing performance.

Kamugisha and Assoua (2020) investigated the effects of a devaluation on the trade balance in Uganda in both the short run and long run. The study employed an autoregressive distributed lag model (ARDL) approach to predict the long-term and short-term outcomes of a possible devaluation of Uganda's currency. The results suggest that incomes significantly affect trade balances in the long run and short run, while real exchange rates were found to only affect trade balances in the short run.

Oniyide and Ogunjinmi (2021) examined the effect of manufacturing industrial production index on economic growth in Nigeria using annual data from 1980 to 2018 sourced from World Development Indicators (WDI) and the Central Bank of Nigeria Statistical Bulletin. The study employs Johansen and the Canonical cointegration technique and impulse response function. The empirical result reveals that manufacturing industrial production index non-significantly decreases gross domestic product in the first model while across the second and third models, manufacturing industrial production index significantly increases gross domestic product in Nigeria in the long run.

Uche and Nwamiri (2021) leveraged the non-linear autoregressive distributed lag to trace the possible asymmetric pass-through of the exchange rate to output growth in Nigeria. The empirical findings reveal an asymmetric pass-through from the exchange rate to productivity. Exchange rate depreciation led to output retardation in the short run, but neither appreciation or depreciation of the exchange affected output in the long run. The findings highlight that the exchange rate depreciation of the local currency does not improve the country's productivity. This reveals a disconnection and misalignment between exchange rate and productivity in Nigeria.

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Rhamouni (2021) examined the capacity utilisation rates of Tunisian firms using the database collected by the World Bank Enterprise Surveys in 2020. The study employs fractional regression models that ensure predictions within the unit interval. The findings show that capacity utilisation is negatively related to the firm's experience in export, and positively associated with the firm size. The study also found that political connections are negatively associated with the firm's capacity utilisation. The estimation results reveal that the perception of political instability as an obstacle to the current operations of the establishment significantly affects capacity utilisation.

Onwuka (2022) examined the impact of exchange rate volatility on the performance of the manufacturing sector in Nigeria from 1981 to 2020 using the ARCH/GARCH model and Autoregressive Distributed Lag Model (ARDL). The ARDL results show that exchange rate volatility, interest rate, and inflation rate have a negative impact on the performance of the manufacturing sector in the long run while import and gross capital formation have a positive effect on manufacturing performance in the long run.

Ogunleye (2022) examined how far currency depreciation affects domestic output in Nigeria. To achieve this objective, this study uses the Granger causality test and ECM estimation technique. The variables were found to be non-stationary at levels but stationary after first differencing and were also co-integrated. The result from the estimation of the domestic output function shows that depreciation of the Naira exerts a positive impact on the level of domestic output in the long run but a negative impact in the short run.

Iboma (2022) examined the effect of currency devaluation on the trade balance in Nigeria. Time series data were sourced from the Central Bank of Nigeria (CBN) Statistical bulletin, the United Nations Conference on Trade and Development (UNCTAD), the Handbook of Statistics, and the IMF International Financial Statistics from 1980 to 2017. The Error Correction Model was employed and the findings reveal that currency devaluation proxy by Nominal exchange rate (NEXR) considered in the model has a positive significant effect on trade balance (TB) only in the long run. In the short run, the effect was not significant and negative.

Omhonria and Needon (2022) empirically examined the relationship between production capacity improvement and organisational performance of manufacturing firms in Rivers state, Nigeria. The cross-sectional survey was adopted in the study. A

sample size of one hundred and forty-seven (147) was drawn from the population. Spearman's rank order correlation was used in analysing the bivariate hypothesis. It was revealed that there is a significant positive relationship between the dimensions of production capacity improvement (industrial production index) with the measures of organisational performance (goal attainment and operational efficiency).

2.5 Gap in Empirical Review

There is a gap in empirical research regarding the impact of the naira free fall on the industrial production index of manufacturing firms in developing countries like Nigeria. Limited studies and a lack of reliable data have hindered the exploration of this topic. While one prior study has examined this relationship, it remains an underexplored area of research. Previous studies have focused on other factors affecting the industrial production index, making this study unique in its specific focus on the naira free fall's influence. By investigating the relationship between currency depreciation and industrial production, this study aims to provide valuable insights into the challenges faced by Nigerian manufacturing firms due to currency fluctuations. Addressing this research gap has the potential to contribute to the existing knowledge and inform policymakers and industry stakeholders on strategies to enhance industrial productivity and competitiveness in Nigeria. Further research is needed in this area to gain a comprehensive understanding of the impact of the naira free fall on the industrial production index.

3. METHODOLOGY

The research methodology adopted for this study was an ex-post facto design, selected for its ability to facilitate future replication by different researchers aiming to either corroborate or contest the validity of the study's findings. Conducted within the context of Nigeria, the study specifically delved into the industrial production index of manufacturing firms, a crucial aspect of the nation's economic landscape. In terms of data sourcing, the study relied on secondary data, meticulously extracted from the comprehensive World Bank Database. The population under scrutiny encompassed all manufacturing companies operating within Nigeria, providing a broad and inclusive scope for analysis. To further refine the analysis, these companies were categorised into various sub sectors as defined by the Central Bank of Nigeria (CBN). These subsectors ranged from traditional sectors like Meat & Dairy Products and Textiles to more contemporary ones such as Radio, TV & Communication Equipment and Motor

Vehicle Assembly. This comprehensive approach ensured that the study captured a diverse array of industrial activities within the Nigerian context. Additionally, to provide a robust basis for analysis, the study utilised data from the CBN Statistical Bulletin of 2021, allowing for a comprehensive examination of trends and patterns in industrial production over time. Overall, the meticulous selection of research design, data sources, and population coverage contributed to the rigour and reliability of the study's findings, offering valuable insights into the dynamics of industrial production in Nigeria.

Model Specification

Model specification entails identifying the dependent and independent variables that are important in a given situation. The model will be specified in line with Inyiama and Ezeugwu (2016) with the following mathematical formula:

$$IPI = F\,(EXRATE,\ PPP,\ PLR) \qquad\qquad [\text{Equation (1)}]$$

$$IPI_{it} = \beta_0 + \beta_1 EXRATE_{it} + \beta_2 PPP_{it} + \beta_3\,PLR_{it} + c_{it} + \varepsilon_{it} \qquad [\text{Equation (2)}]$$

Introducing the control variables, we have:

$$IPI_{it} = \beta_0 + \beta_1 EXRATE_{it} + \beta_2 PPP_{it} + \beta_3 PLR_{it} + c_{it} + \varepsilon_{it} \qquad (3)$$

Where;

IPI: Industrial Production Index

EXRATE: Exchange Rate

PPP: Purchasing Power Parity Conversion Factor

PLR: Price Level Ratio

β_0 is the constant term or intercept for firm *i* in the year t.

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$, and β_6 are linear regression coefficients to be estimated.

c_{it} is the non-observable individual effect while ε_{it} is the disturbance or error term for firm *i* in the year t.

4.   DATA ANALYSIS AND DISCUSSION

Table 4.1.1: Descriptive Statistic for the Variables Under Study

	IPI	EXRATE	PPP	PLR
Mean	12.73326	138.8674	56.84813	0.337722
Maximum	20.92708	434.7000	152.5700	0.566785

Minimum	6.552817	8.038285	2.350000	0.118402
Skewness	0.412103	0.899870	0.574265	0.162787
Kurtosis	1.706997	3.314062	2.125505	1.749948
Jarque-Bera	3.134900	4.450266	2.778480	2.224839
Probability	0.208576	0.108053	0.249265	0.328763
Observations	32	32	32	32

Source: Author's Computation from Eviews 10.0 Statistical Software

Table 4.1.1 above reveals the variable description of the 32 observations of the panel data for sampled conglomerates. The normality of the distribution of the data series is shown by the coefficients of Skewness, Kurtosis, and Jarque-Bera Probability. From Table 4.2.1, the probability of the Jarque-Bera Statistics for Industrial production index (0.293736), Exchange Rate (0.108053), Purchasing Power Parity Conversion Factor (0.249265), and Price Level Ratio (0.328764) are normally distributed. The kurtosis coefficients confirm that the Industrial production index (1.869732), Exchange Rate (3.314062), Purchasing Power Parity Conversion Factor (2.125505), and Price Level Ratio (1.749950), are normally distributed. However, Lending Interest Rate (5.089460) has an abnormal distribution.

Table 4.2.2: OLS Estimation Result [Dependent Variable: IPI]

Variable	Coefficient	Standard Error	t-Stat	p-Value
EXRATE	-0.058711	0.013373	-4.390242	0.0001
PPP	0.165181	0.038992	4.236286	0.0002
PLR	-43.48739	4.957476	-8.772083	0.0000
C	26.18282	1.273750	20.55569	0.0000
$R^2 = 0.842$, Adjusted $R^2 = 0.825$, F-Stat = 49.90452, Prob(F-stat) = 0.000000, D.W. Stat. = 0.93				

Source: Computed by Researcher Using Eviews 10.0 Statistical Software

Exchange Rate: The value of the t-statistics (-4.390242 > 2) and the probability of the t-Statistic (0.0001 > 0.05) shows that Exchange Rate has a significant effect on the Industrial production index in Nigeria.

Purchasing Power Parity Conversion Factor: The value of the t-statistics (4.236286 < 2) and the probability of the t-Statistic (0.0002 > 0.05) shows that Purchasing Power Parity Conversion Factor has a significant effect on the Industrial production index in Nigeria.

Price Level Ratio: The value of the t-statistics (-8.772083 > 2) and the probability of the t-Statistic (0.0000 < 0.05) shows that the Price Level Ratio has a significant effect on the Industrial production index in Nigeria.

Statistical Criteria (First Order Tests)

The value of the Adjusted R^2 (0.825) mirrors that approximately 83% of changes in the industrial production index in Nigeria are explained by the independent variables. The remaining 17% are explained by other factors capable of influencing the industrial production index in Nigeria and factors contained in the error term. The value of the f-test is used to check for the overall significance of the model and if the value of the probability of the F-Stat (0.000000) shows that the model is significant and statistically fit. The Durbin-Watson Statistic (0.93) is approximately closer to 2 than four showing the presence of positive autocorrelation in the time series data.

4.3 Test of Hypotheses

The hypotheses were tested using the following decision rule:

Statement of Decision Criteria

According to Gujarati and Porter (2009), the decision rule involves accepting the alternative hypothesis (H_1) if the sign of the coefficient is either positive or negative, the modulus of the t-Statistic > 2.0, and the P-value of the t-Statistic < 0.05. Otherwise, accept H_0 and reject H_1.

Hypothesis One

Step 1: Restatement of the Hypothesis in Null and Alternate Forms

H_0: Official exchange rate has a non-significant effect on the industrial production index in Nigeria.

H_1: Official exchange rate has a significant effect on the industrial production index in Nigeria.

Step 2: Presentation of Test Results

Table 4.2.4 Regression Analysis result is used to test the above-stated hypothesis.

Step 3: Decision

From the regression analysis result in Table 4.2.4, the calculated p-value for EXRATE is 0.0001 which is less than the alpha value of 0.05. It falls in the rejection region, hence, we reject the first null hypothesis (H_o). The conclusion here is that the Official Exchange Rate has a statistically significant negative effect on the industrial production index in Nigeria.

Hypothesis Two

Step 1: Restatement of the Hypothesis in Null and Alternate Forms

H_o: Purchasing power parity conversion factor has a non-significant effect on industrial production index in Nigeria.

H_1: Purchasing power parity conversion factor has a significant effect on the industrial production index in Nigeria.

Step 2: Presentation of Test Results

Table 4.2.4 Regression Analysis result is used to test the above-stated hypothesis.

Step 3: Decision

From the regression analysis result in Table 4.2.4, the calculated p-value for PPP is 0.0002 which is less than the alpha value of 0.05. It falls in the rejection region, hence, we reject the second null hypothesis (H_o). The conclusion here is that the Purchasing Power Parity Conversion Factor rate has a statistically significant positive effect on the industrial production index in Nigeria.

Hypothesis Three

Step 1: Restatement of the Hypothesis in Null and Alternate Forms

H_o: Price level ratio has a non-significant effect on the industrial production index in Nigeria.

H_1: Price level ratio has a significant effect on the industrial production index in Nigeria.

Step 2: Presentation of Test Results

Table 4.2.4 Regression Analysis result is used to test the above-stated hypothesis.

Step 3: Decision

From the regression analysis result in Table 4.2.4, the calculated p-value for PLR is 0.0000 which is less than the alpha value of 0.05. It falls in the rejection region, hence,

we reject the third null hypothesis (H_o). The conclusion here is that the Price Level Ratio has a statistically significant negative effect on the Industrial production index in Nigeria.

4.4   Discussion of Findings

4.4.1   Effect of Official Exchange Rate on Industrial Production Index

The test of hypothesis one revealed that the official exchange rate has a significant negative effect on the industrial production index in Nigeria. The table also depicts that a unit increase in the Official Exchange rate results in a 0.17% increase in industrial production index in Nigeria. The result implies that the official exchange rate can be used to predict the industrial production index of manufacturing firms in Nigeria. The significant negative effect of the Official Exchange Rate on industrial production index in Nigeria shows that exchange rate volatility has not really helped manufacturing firms in achieving the required productive output. The outcome could also be a result of the multiple exchange rate regime practised in Nigeria. Where the official exchange rate is significantly lower than the exchange rates obtained in the parallel forex markets, hence, the negative result. The multiple exchange rates makes the official exchange rate deceitful in predicting the industrial production index of manufacturing firms in Nigeria in practice.

4.4.2 Effect of Purchasing Power Parity Conversion Factor on Industrial Production Index

The test of hypothesis two revealed that Purchasing Power Parity Conversion Factor has a significant positive effect on industrial production index in Nigeria. The table also depicts that a unit increase in Purchasing Power Parity Conversion Factor results in a 0.17% increase in industrial production index in Nigeria. The findings shows that purchasing power parity conversion factor can be used to predict the industrial production index of manufacturing firms in Nigeria. The result implies that when the price levels differences between Nigeria and the selling country are controlled it increases the industrial production index in Nigeria. Typically, higher income countries have higher price levels, while lower income countries have lower price levels (Balassa-Samuelson effect). The positive result justifies the economic situation in Nigeria, where every development indices are on an unprecedented decline due to ever increasing price levels. The naira has been devalued to the point that the lowest denomination of the naira cannot buy anything in the local markets, not to mention

the global marketplace, hence, the price level difference needs to be controlled effectively.

4.4.3 Effect of Price Level Ratio on Industrial Production Index

The test of hypothesis two revealed that the Price Level Ratio has a significant negative effect on industrial production index in Nigeria. The table also depicts that a unit increase in the Price Level Ratio results in a 43% decrease in the industrial production index in Nigeria. The result implies that the Price Level Ratio can be used to predict the industrial production index of manufacturing firms in Nigeria. The significant effect of Price Level Ratio on industrial production index in Nigeria implies that when the price level between the demanding country and the supply country is isolated, manufacturing companies' industrial production index decreases significantly. The result points to the inflation rate as the factor causing the low industrial production index of manufacturing firms in Nigeria.

5. CONCLUSION AND RECOMMENDATIONS

High rates of naira free falls in the foreign exchange markets have a ripple effect on all facets of economic activities, from importation, and exportation, as well as the prices of goods in the local market. The major problem with devaluation is that it also increases the price of raw materials needed for production, and a subsequent increase in the price of goods, with a resultant decline in demand. When such a decline in demand ensues, manufacturing firms are usually at the short end of the stick due to the rise in the cost of raw materials. These might constitute major problems for manufacturing firms in maximising firm productivity. Consequently, the study evaluated the naira free fall and industrial production index of manufacturing firms in Nigeria.

From the regression analysis, the official exchange rate and price level ratio have a significant negative effect on the industrial production index in Nigeria. On the other hand, the purchasing power parity conversion factor has a significant negative effect on the industrial production index in Nigeria. The study, therefore, concludes that naira free fall can be used to predict the industrial production index of manufacturing firms in Nigeria. From the findings, the following recommendations were made:

i. The government should remove the multiple exchange rate regime. There should be a single exchange rate recognized in all foreign exchange markets

and by local banks in Nigeria. This ensures a proper estimation of the effect of the exchange rate on industrial production index in Nigeria.

ii. The central bank of Nigeria through its monetary and fiscal policies should ensure the increase in absolute purchasing power of Nigeria's currency.

iii. The government should strive to reduce the current persistent rise in the price level of goods and services to increase the purchasing power of the Naira in the local and global markets.

References

Adeyemi, P. A. and Olufemi, O. B. (2016). The Determinants of Industrial production index in the Nigerian Manufacturing Sector. *Journal of Economics and Sustainable Development,* 7(5); 20-31

Dung, S. and Okereke, E. J. (2022). Determinants of the exchange rate in African Sub-saharan countries. *Saudi Journal of Economics and Finance,* 6(4); 154-163

Eluyela, D. (2019). Impact of exchange rate on the manufacturing sector in Nigeria. *International Journal of Mechanical Engineering and Technology,* 10(2); 1568-1583

Ezie, O., Sulaiman, A. and Abdelrasaq, N. (2020). Effect of exchange rates on manufacturing sector growth in Nigeria: 1986-2014. *FUW-International Journal of Management and Social Sciences,* 1(2&3); 1-15

Falaye, A., Eseyin, O., Otekunrin, A. and Asamu, F. (2019). Impact of exchange rate on the manufacturing sector in Nigeria. Retrieved from *https://www.researchgate.net/publication/331564288_Impact_of_exchange_rate_on_the_manufacturing_sector_in_Nigeria*

Iboma, G. E. (2022). Analysis of the effects of currency devaluation on the trade balance and economic growth in Nigeria. *Multidisciplinary Journal of Research Development,* 31(1); 1-10

Kadochnikov, Denis (2013). Gustav Cassel's purchasing power parity doctrine in the context of his views on international economic policy coordination. *European Journal of the History of Economic Thought,* 20(6); 1101–1121.

Kamugisha, G. and Assoua, J. E. (2020). Effects of a Devaluation on Trade Balance in Uganda: An ARDL Cointegration Approa. *International Journal of Economics and Finance,* 12(7)

Kang, J. W. (2016). International trade and exchange rate. *ADB Economics Working Paper Series,* 498.

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Kang, S.M. and Kim, M.H. (2015). Short-run cost minimization and industrial production index of regional public hospitals in South Korea, *Modern Economy*, 6(1); 21-29.

Khan, Z., Ali, A. & Ali, S. (2016). Impact of devaluation on the balance of trade: A case study of Pakistan economy. *Asian Journal of Economic Modelling*, 4(2), 90-94

Klenton, W. & Murry, C. (2022). Industrial production index Rate. https://www.investopedia.com/terms/c/capacityutilizationrate.asp

Klenton, W. & Murry, C. (2022). Industrial production index Rate. https://www.investopedia.com/terms/c/capacityutilizationrate.asp

Mlambo, C. (2020). Exchange rate and manufacturing sector performance in SACU states. Retrieved from *https://www.tandfonline.com/doi/full/10.1080/23311975.2020.1787735*

Nelson, R. A. (2019). On the Measurement of Industrial production index. *The Journal of Industrial Economics,* 37(3): 273-286

Nikiforos, M. (2012). The (Normal) rate of industrial production index at the firm level. *Levy Economics Institute Working Paper,* No. 737.

Ogunleye, A. G. (2022). How far does currency depreciation affect domestic output in Nigeria? *BERJAYA Journal of Services and Management,* 18(1); 1-10

Okunade, S. O. (2020). Effect of Capacity Utilisation on Manufacturing Firms' Production in Nigeria. *Global Journal of Management and Business Research: Economics and Commerce,* 18(1); 1-15

Omhonria, O. D. and Needorn, R. S. (2022). Production capacity improvement and organizational performance of manufacturing firms in Rivers State, Nigeria. *International Journal of Advanced Academic Research,* 8(1); 13-29

Oniyide, F. V. and Ogunjinmi, O. O. (2021). Effect of Manufacturing Industrial production index on Economic Growth: An Empirical Evidence of Nigeria. *International Journal of Research and Scientific Innovation,* 8(5); 39-48

Onwuka, C. E. (2022). Exchange rate volatility and the performance of the manufacturing sector in Nigeria. Retrieved from *https://assets.researchsquare.com/files/rs-1111246/v1_covered.pdf?c=1646673530*

Osigwe and Obi (2015). Does Industrial production index Rate Affect Imports of Raw Materials in Nigeria? *International Journal of Economics and Financial Issues, 5(2),* 489-492.

Osigwe and Obi (2015). Does Industrial production index Rate Affect Imports of Raw Materials in Nigeria? *International Journal of Economics and Financial Issues, 5(2),* 489-492.

Rhamouni, M. (2021). Determinants of industrial production index by firms in developing countries: evidence from Tunisia. *International Journal of Learning, Innovation, and Development*, 13(3); 212-245

Singh, M., Rathi, R. and Garza-Reyes, J.A. (2021). Analysis and prioritization of Lean Six Sigma enablers with environmental facets using the best worst method: A case of Indian MSMEs, *Journal of Cleaner Production*, 279(1).

Uche, E. and Nwamiri, S. I. (2021). Dynamic Effects of Exchange Rate Movements on Productivity Levels: New Evidence From Nigeria Based on NARDL. *Journal of Development Policy and Practice*, 1(2)

World Bank (2022). Metadata Glossary - Price level ratio. Retrieved from *https://databank.worldbank.org/metadataglossary/world-development-indicators/series/PA.NUS.PPPC.RF*

Yioyio, C. G. (2015). What caused the Asian currency and financial crisis? Part I: A macroeconomic overview. *NBER Working Paper:* 6833.

Zhang, D. (2020). Industrial production index under credit constraints: A firm-level study of Latin American manufacturing. *International Journal of Finance and Economics,* 1(1); 21-30