

Impact of Inflation on Manufacturing Sector's Investment Returns

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Abstract: *This paper examines the impact of inflation on return on investment of manufacturing firms in Nigeria. Secondary data covering a period of 15 years 2013 to 2024 were collected from National Bureau of Statistics, CBN statistical bulletin and Federal Reserve of Economic Data. The data was analyzed using regression method of analysis. The result of the regression reveals that inflation does not have a significant effect on investment returns of manufacturing firms in Nigeria. The study therefore recommends that inflation should be controlled through appropriate economic policies to ensure that the rate of inflation is fair and stable to ensure attractive investment return. Also other variables that could impact investment returns should be examined by other researchers.*

Keywords: Manufacturing, Inflation, ROI, Investment Decisions, Monetary Policy.

Introduction

Inflation, a persistent increase in the general price level, remains a pressing concern for economies worldwide, particularly in the wake of the COVID-19 pandemic (World Bank, 2022). The manufacturing sector, a vital driver of economic growth and development, is susceptible to inflation's impacts, which can erode investment returns and hinder competitiveness (Khan et al., 2020). This study investigates the relationship between inflation and investment returns in the manufacturing sector, shedding light on the mechanisms through which inflation affects investment decisions.

Recent research highlights the complex interactions between inflation, monetary policy, and investment decisions (Bhattarai et al., 2022). Inflation uncertainty, for instance, can reduce investment in capital and research and development (Serven, 2020). Moreover, the relationship between inflation and investment returns is influenced by macroeconomic variables such as interest rates, exchange rates, and GDP growth (Lucas, 2020).

The manufacturing sector's vulnerability to inflationary pressures is exacerbated by global economic trends, including shifts in commodity prices, trade policies, and supply chain disruptions (IMF, 2022). The COVID-19 pandemic has underscored the importance of understanding the impact of inflation on manufacturing sector's investment returns, particularly in emerging economies (WTO, 2022).

Despite the growing body of research, the nuances of this relationship remain understudied, particularly in the context of industry-specific analyses and emerging economies (OECD, 2022).

Statement of Problem

Despite the critical role of the manufacturing sector in driving economic growth and development, the relationship between inflation and investment returns in this sector remains poorly understood, particularly in the context of emerging economies and industry-specific dynamics. Recent studies have highlighted the complex interactions between inflation, monetary policy, and investment decisions (Bhattarai et al., 2022), but to the best of my knowledge the sector-specific implications till date remain understudied. The major objective of this study is to determine the impact of inflation the return on investment of manufacturing firms.

Review of Related Literature

Conceptual Review

Manufacturing involves the transformation of raw materials into intermediate or finished goods. Manufacturing sector is concerned with the production, processing of items, and engaging in either creation of new commodities or in value addition (Adebayo, 2011). According to Dickson (2010), manufacturing sector is responsible for the large share of the industrial sector in developed economy. Also, manufacturing sector plays an important role in the transformation of a modern economy. Manufacturing sector is a subsection

of the industrial sector. It is a trial for increasing the productivity interrelated to import replacement and export expansion, creating foreign exchange income capacity; which result to employment and per capita income, with project unique consumption patterns. Its contribution to the Gross Domestic Product (GDP), the manufacturing sector is paramount and has been overhauled by the service sector in a number of enterprise for Organization of Economic Co-operation and Development (OECD) countries (Ugwanyi, Utazi, Micheal&Umedike, 2015). Omankhanlen and Owonibi (2012) noticed that this sector is riddled with various challenges. Apart from infrastructure, there are other challenges such as high inflation rate and bank unwillingness to lend to the manufacturing sector though the monetary authorities rank it as the priority sector.

Inflation

Inflation is the general rise in price of goods and services. Lokeswear Reddy (2012) defined inflation as a situation in the economy where there is more money chasing less goods and services. Bawa *et al.* (2015) and Uwubanmwun and Egobsa (2015) see inflation as a persistent rise in the general level of prices of goods and services in an economy over a period of time. Khumalo *et al.* (2017) noted that a popular conclusion of the meaning of inflation is gradual reduction in the purchasing value. Similarly Fashagba (2016) notes that inflation is the reduction in the purchasing power of a currency; and state that inflation may not be harmful to an economy if it is well-managed. When the general price levels of goods and services keep increasing there is said to be inflation. The result of inflation is negative on the overall growth, the process of the economic development of financial sector and the first direct victims of inflation are usually the poor. During inflation, the same amount of money purchases lesser quantity of goods and services tomorrow than today; and this reduces the standard of living of a people (Maku&Adelowokan, 2013). Factors that affect inflation according to Ibrahim and Agbaje (2013) include structural factors that reduce the real income to the people, including high nominal wages. Aliso (2015) argued that inflation is a key component of an economy; and that rates of inflation and unemployment are indicators of economic growth. Faroh (2015) acknowledged that low inflation rate is a sign of internal economic stability; while Jelilou (2016) notes that inflation is important to economy. Inflation can be categorized into: creeping inflation, walking inflation, and hyper-inflation (Chude&Chude, 2015).

Return on Investment

ROI is the general term used to express the interest for investment. It is defined differently by different scholars. Botchkerv and Andru (2011) describe ROI as a means of evaluating the efficiency of investment; and as a tool for comparing the performance of different investments. ROI enables investors to evaluate the performance of different investments. Nwude (2018) view ROI as a different perspective of profitability measure; and conceive it as an important criterion for judging where new funds should be invested. Wheelen and Hunter (2004, cited in Preuse, 2016) argue that ROI is a vital tool for monitoring performance in the business world.

Empirical Review

Numerous research have been carried out to investigate the impact of inflation on manufacturing sector's investment returns. These studies with different economic techniques examined the impact of inflation on manufacturing sector output both within and outside the country. Umar, *et al* (2021) investigated the impact of inflation on economic growth in Nigeria from 1999 to 2017 using ordinary least square (OLS) technique. The result obtained showed that inflation has positive but non-significant impact on economic growth in Nigeria. The study recommended that policies which will enhance improvement in the economy should be embraced such as implementation of the minimum wage, ease of doing business and efficient interest rate regime.

Nwabuisi *et al* (2020) examined the effect of bank credit on the performance of manufacturing sector in Nigeria. The result of their studies revealed that bank credit and interest rate have significant positive effects on manufacturing sector performance while exchange rate showed a significant negative impact on manufacturing sector performance in Nigeria. The study recommended that monetary authorities should introduce policies that will bring down lending rate to stimulate borrowers.

Olugbenga and Oluwabunmi (2020) investigated the impact of inflation on economic growth, evidence from Nigeria, using autoregressive distributed lag (ARDL). The findings from the study indicate that inflation and real exchange rate exert significant negative impact on economic growth while interest rate and money supply generate a positive and significant impact on economic growth. The causality result shows that unidirectional relationship exists between interest rate, exchange rate, government consumption expenditures and gross domestic product. Based on the findings, the study recommended for the need of the monetary authorities to tackle inflation vigorously to prevent its adverse effect on the economy. They focused on the Agricultural and manufacturing sectors. From the result they found that bank credit sectoral allocation to the manufacturing sector has no impact on the manufacturing sector output in the short-run but became significant and positive in the long-run. Also from their result, inflation rate and interest rate have significant impact on manufacturing sector output both in the short-run and long-run. They recommended that adequate allocation of credits to the sector will positively increase the sectoral output which will in turn promote economic growth and development.

The relationship between inflation and return on investment had been widely examined in different studies. Garoufalis (2017) noted that

the influence of inflation on interest rate and exchange rate is dominant. Interest rate is a form of return. Thus it can be argued that interest affects inflation and ROI. In other words, inflation plays a notable role on the level of the interest rate of any nation. Also, since investment is driven by the rate of return (Nwude & Nwuke, 2012; Zamfiri *et al.*, 2016), it may be implied that inflation affects return on investment as it responds to change in investment. Investment responds inversely to change in inflation. The implication is that as inflation level rises; investment level will reduce along with return on investment. Onwe and Oluwalaniran (2014) observed that different researchers disagree on the relationship between inflation and return on investment. Some researchers held that there is a positive relationship between inflation and return on investment while others held otherwise. Thus, two opposite directions in the relationship between inflation and return on investment exist in literature. Modebe & Ezeaku (2016) used annualized time-series data from 1982 to 2014 to investigate the effect of inflation on manufacturing sector performance in Nigeria, with the main goal of investigating the short-run and long-run relationship between them. In the estimations, Johansen's cointegration test, the Granger causality test, and the vector error correction model (VECM) were used. The baseline regression results show that inflation and interest rates have a negative and not significant impact on manufacturing sector growth, whereas exchange rates appear to have a positive and significant impact on manufacturing sector value-added growth. The Granger causality results show a unidirectional connection from exchange rate to output growth. Inflation and interest rates, on the other hand, are not causal for production growth, using annual time series data for Ghana, Bans-Akutey, Yaw, & Mohammed (2016) investigated the effect of inflation on manufacturing sector productivity from 1968 to 2013. The Johansen test (JT), the Vector Error Correction Model (VECM), and the Ordinary Least Squares (OLS) regression test were used for empirical verification. Their findings point to a considerable long run consistent link between inflation and manufacturing sector productivity. The VECM analysis, however, revealed an insignificant short-run connection between inflation and manufacturing sector productivity. The OLS test results show a negative significant relationship between inflation and manufacturing sector productivity. According to the data, inflation has resulted in a decline in manufacturing sector productivity. According to the study, policymakers should carefully manage inflation to boost manufacturing sector productivity.

Chaudhry, Ayyoub, & Imran (2013) investigated the influence of CPI inflation on Pakistan's overall economic growth. Using OLS methodology and annual time series data (1972–2010), they show that an increase in inflation affects the growth of agriculture, manufacturing, and services in distinct ways. They discovered an adverse link between consumer pricing index (CPI) inflation and manufacturing sector growth, whereas inflation was shown to stimulate agricultural and service sector value-added growth. They recommend that inflation should be kept to single digits in general. Mwakanemela (2013) used time-series data from 1990 to 2011 to investigate the impact of inflation on economic growth in Tanzania. To analyze the data, the study used the Johansen cointegration test. Inflation harms economic growth, according to the findings. The study also found a long-run link between inflation and economic growth in Tanzania during the study period. Bakare, Kareem, & Oyelekan (2015), on the other hand, examined the influence of inflation on economic growth and development in Nigeria. According to Mamo (2012), the debate between inflation and growth is not just about whether there is a positive or negative relationship between them, but also about the necessity to determine the causal direction between these two components. Some research suggests that the relationship between inflation and economic activity is unidirectional, whilst others show bidirectional, or even no, causality.

Odu *et al* (2021) investigated the effect of inflation on growth of manufacturing sector in Kenya from 2008-2017. Some of the variables include inflation, manufacturing value added and consumer price index. The result of their study revealed that inflation has a statistical and significant negative effect on the growth of the manufacturing sector in Kenya. Bans – Akutey *et al* (2016) examined the effect of inflation on manufacturing sector productivity in Ghana. Using manufacturing sector productivity (MSP) as the dependent variable they found that there exists a stable and significant long-run relationship between inflation and manufacturing sector productivity. However, their result revealed that in the short-run, there was an insignificant relationship between inflation and manufacturing sector productivity.

Kasidi, *et al* (2013), using time series data for a period of 1990 to 2011 and ordinary least square method studied the impact of inflation on economic growth in Tanzania. The study findings suggested that inflation has a negative impact on economic growth in Tanzania, and also that there was no long-run relationship between inflation and economic growth during the period of study in Tanzania.

Umaru and Zubairu (2012) examined the impact of inflation on economic growth and development in Nigeria between 1970-2010. The result of the study showed that inflation has a positive impact on economic growth through encouraging productivity and output level and on evolution of total factor productivity.

Research Gaps

We discovered that there are conflicting results after reviewing various literatures. Existing studies have primarily focused on the aggregate impact of inflation on investment (Lucas, 2020), neglecting the sector-specific dynamics and transmission channels.

Moreover, the literature lacks empirical evidence on the impact of inflation on investment returns in emerging economies and specific manufacturing industries.

Theoretical Review

The impact of inflation on manufacturing sector's investment returns can be analyzed through various theories

Monetary Policy Transmission Mechanism (MPTM): MPTM posits that inflation affects investment returns through interest rates, exchange rates, and expectations (Bhattarai et al., 2022). Central banks' monetary policy decisions influence inflation expectations, which in turn affect investment decisions.

Production Cost Theory (PCT): PCT suggests that inflation increases production costs, reducing profitability and investment returns (Khan et al., 2020). Higher production costs lead to reduced competitiveness and lower investment.

Uncertainty Theory (UT): UT suggests that inflation uncertainty reduces investment in capital and research and development (Serven, 2020). Inflation uncertainty leads to reduced investment and lower returns.

Research Methodology

The population in this study comprises the listed manufacturing companies on the Nigerian Stock Exchange. Ten companies were selected using purposive sampling method with the aim of obtaining representative samples. The study used the regression method of data analysis. One major advantage for the use of this technique is based on universal acceptability and amenability to data. The dependent variable adopted in this study is manufacturing sector’s investment returns which is represented by return on investment (ROI) while the independent variable is inflation measured by inflation rate. Gross domestic product and Interest rate were introduced as control variables. The researcher collected secondary data from the National Bureau of Statistics, CBN statistical bulletin and Federal Reserve of Economic Data. The data were analyzed using computer statistical program E-views 10. These data extracted for the research covered a study period of 15 years spanning from 2010 to 2023.

Model specification

The model specified by Ihugba, Orji and Duru(2021) was adjusted for the study. Our model can be stated as:

$$ROI = \beta_0 + \beta_1INF + \beta_2GDP + \beta_3INT + \epsilon$$

Where: ROI: Return on Investment (dependent variable)

INF: Inflation Rate (independent variable)

GDP: Gross Domestic Product growth rate (control variable)

INT: Interest Rate (control variable)

ε: Error term

β1; β2; β3 = The parameters for the independent variables or slope coefficients

β0 =The intercept; the expected value of ROI when all the independent variables assume zero as value.

Results and Discussion

Data Description

This chapter presents and analyze the result obtained from the data generated from the CBN Statistical Bulletin, Nigerian Stock Exchange Annual report, and the Security and Exchange Commission Annual reports for the period of the study. This chapter is primarily concerned with the empirical analysis of the study.

Table 1

Augmented Dickey-Fuller (ADF)

| Variable | ADF Statistics | 1% Critical Value | 5% Critical Value | 10% Critical Value | Order of Integration | Level of Significance |
|----------|----------------|-------------------|-------------------|--------------------|----------------------|-----------------------|
| ROE | -4.870281 | -4.297073 | -3.212696 | -2.747676 | 1(0) | 0.0045 (5%) |

| | | | | | | |
|--------|-----------|-----------|-----------|-----------|------|--------------|
| LogINF | -1.138150 | -4.297073 | -3.212696 | -2.747676 | 1(1) | 0.6546 (10%) |
| LogINT | 3.523307 | -4.297073 | -3.212696 | -2.747676 | 1(1) | 1.0000 (10%) |
| LogGDP | -0.613323 | -4.121990 | -3.144920 | -2.713751 | 1(1) | 0.8328 (10%) |

Source: E-view 10 Arranged Result, (2024)

The Augmented Dickey-Fuller (ADF) unit root test was used to determine whether the variables were stationary. We tested levels and differences with the ADF approach. Table 4 shows that the ADF statistics values of -4.870281, -1.138150, 3.523307, and -0.613323, respectively, for all the variables (ROE, LogINF, LogINT, and LogGDP) are more than the 1%, 5%, and 10% critical level values in absolute terms. Furthermore, at the 5% and 10% levels of significance, the ADF statistics demonstrate that the dependent and independent variables are both stationary at 1(0) and 1(1), respectively. Thus, data analysis can make use of ordinary least squares data estimation.

Table 2:
Correlation Matrix

| Variable | ROE | LogINF | LogINT | LogGDP |
|----------|----------|----------|----------|--------|
| ROE | 1 | | | |
| LogINF | 0.095171 | 1 | | |
| LogINT | 0.070423 | 0.918052 | 1 | |
| LogGDP | 0.022372 | 0.982189 | 0.902617 | 1 |

Source: E-view 10 Arranged Result, (2024)

The type of relationship that exists between the independent and dependent variables in the model is indicated by the correlation matrix in table 5, above which reveals that LogINF has a coefficient of ($r = 0.095171 > 0.05$), which revealed that LogINF has strong positive correlation with ROE; this implies that an increase in LogINF will have positive favourable effect on the ROE of deposit money banks in Nigeria. LogINT has a coefficient of ($r = 0.070423 > 0.05$), which revealed that LogINT has strong positive correlation with ROE; this implies that an increase in LogINT will have a positive effect on the ROE of deposit money banks in Nigeria. LogGDP has a coefficient of ($r = 0.022372 < 0.05$), which revealed that LogGDP has strong positive correlation with ROE; this implies that a decrease in LogGDP will have weak adverse effect on ROE of deposit money banks in Nigeria. With a correlation coefficient of ($r = 0.022372 < 0.05$), LogGDP and ROE show a strong positive relationship. This suggests that a decline in LogGDP will have a negligible negative impact on the ROE of Nigerian deposit money banks.

Table 3
Regression Result

Dependent Variable: ROE

Method: Least Squares

Date: 05/01/25 Time: 23:29

Sample: 2010 2023

Included observations: 15

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| LOGINF | 3.609621 | 2.962522 | 1.218428 | 0.2540 |
| LOGINT | -0.130794 | 1.052750 | -0.124240 | 0.9039 |
| LOGGDP | -3.996945 | 3.243072 | -1.232456 | 0.2490 |
| C | 21.30293 | 13.43285 | 1.585883 | 0.1472 |
| R-squared | 0.153714 | Mean dependent var | | 13.11615 |
| Adjusted R-squared | -0.128381 | S.D. dependent var | | 4.449874 |
| S.E. of regression | 4.726890 | Akaike info criterion | | 6.192072 |
| Sum squared resid | 201.0914 | Schwarz criterion | | 6.365902 |
| Log likelihood | -36.24847 | Hannan-Quinn criter. | | 6.156342 |
| F-statistic | 0.544903 | Durbin-Watson stat | | 2.435003 |

Source: Computed from E-view 10 (2024)

Discussion

The OLS technique was able to ascertain the extent to which LogINF effects Nigeria's financial model (ROE) based on the findings shown in Table 6. In particular, this effect is shown by LogINF reported p-value of 0.2540, which is higher than the significance value of 0.05, and the t-statistic value of 1.218428, which is lower than 2. The policy appears to have a favorable impact on the return on equity of deposit money banks in Nigeria, as indicated by the LogINF coefficient value of 3.609621. This suggests that for every percent (1%) increase, Nigeria's return on equity would decrease by 36.09%. This result contradicts the findings of Muhammad, Siska, and Haim (2024) but validates the conclusions of Shubham and Anjali (2024).

This OLS analysis for LogINT is demonstrated by the t-statistic value of -0.124240, which is less than 2, and the p-value of LogINT, which is 0.9039, which is more than the significance value of 0.05. The amount of internet transactions has a negative effect on the return on equity of deposit money banks in Nigeria, according to the coefficient value of -0.130794 for LogINT. This suggests that for every percentage point (1%) decline in ROE, DMBs would see an increase of 13.07%. This outcome is consistent with Stephen's findings (2024). However, it runs contrary to the conclusions made by Nusrat et al (2023).

The t-statistic value from the OLS analysis is reported as -1.232456, which is less than 2, and the p-value of LogGDP, which is 0.2490, which is more than the significance value of 0.05. The amount of mobile transactions has a negative effect on the return on equity of deposit money banks in Nigeria, according to the coefficient value of -3.996945 for LogGDP. This suggests that for every percentage point (1%) decline in ROE, DMBs would see an increase of 39.96%. This outcome is consistent with the findings of Rachana, Charu, Rahul, and Deepak, (2024). However, it runs contrary to the conclusions made by Nusrat et al (2023). Lastly, the P-value of F-statistics for all the variables reported as 0.663768 indicating a strong significance effect between the dependent variable and independent variables.

Conclusion and Recommendation

This study seeks to find the effect of inflation on manufacturing sector's return on investment in Nigeria. The result shows that inflation rate has no significant negative effect on investment return in Nigeria. The study also finds that inflation rate does not affect investment. The findings of this study agrees with Uwubanmwen and Eghosa (2015) that inflation is not a strong predictor for stock return. It however, disagrees with the findings of Fashagba et al(2022) that inflation has a significant effect on investment returns of manufacturing firms in Nigeria. The disparity in the findings of this study and previous ones could be explained by level of economic development of the economy under study. The study therefore recommends that inflation should be controlled through appropriate economic policies to ensure that the rate of inflation is fair and stable to ensure attractive investment return. Also other variables that could impact investment returns should be examined by other researchers.

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