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Manufacturing Capacity Utilization and Growth of Manufacturing Industry in Nigeria

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Abstract

This study investigated the impact of manufacturing capacity utilization on growth of manufacturing industry in Nigeria from 1995 to 2023. Using an ex-post facto research design, data from the 2023 edition of the Central Bank of Nigeria's statistical bulletin was analysed through Ordinary Least Squares (OLS) regression. The study treats aggregate manufacturing sector output as the dependent variable and capacity utilization of food and beverages, cement, and oil refining as independent variables. Findings reveal significant positive impacts of food and beverages sector capacity utilization, a negative but significant impact of cement sector utilization, and a positive significant impact of oil refining sector utilization on manufacturing output in Nigeria. Overall, the study concludes that manufacturing capacity utilization plays a crucial role in manufacturing industry growth in Nigeria. Recommendations include investing in innovative technologies and skills development in the food and beverages sector, regulatory reforms and infrastructure investment in the cement sector, modernizing oil refineries and energy diversification, and strengthening local supply chains to support manufacturing capacity utilization and stimulate industry and economic growth.

Keywords: *Manufacturing Capacity Utilization, Manufacturing Industry Growth, Nigeria, Food And Beverages, Cement, Oil Refining, Economic Development*

Introduction

The manufacturing sector has emerged as a primary method for developing countries to capitalise on globalisation and reduce the income disparity with the industrialised world. Manufacturing is a leading industry in many areas of every economy, developed or developing. It serves as a stimulant for a number of processes, including the development of exports and import substitution, the creation of foreign currency earning capacity, the expansion of employment and per capita income, and the effect on unique consumption patterns (Amankwah-Amoah et al., 2020). In addition, it fosters deeper and more fruitful connections across various industries while producing investment capital at a pace quicker than any other sector (Sawik, 2018). According to Arıkan et al. (2018), this industry is seen as a key force behind both technological and human growth, acting as the backbone of advancement in both developed and developing countries. All things considered, the manufacturing sector is crucial

to the contemporary economy since it offers the flexible advantages needed for economic development (Sawik, 2018).

Moreover, manufacturing growth fosters technological innovation and skills development, which are essential for the long-term competitiveness of the economy. The industry's expansion promotes the transfer of technology and knowledge, thereby improving productivity and efficiency across various sectors. Additionally, the development of a robust manufacturing base can stimulate demand for raw materials and intermediate goods, further bolstering other areas of the economy, such as agriculture and mining. Furthermore, a thriving manufacturing sector can enhance the government's fiscal position by increasing tax revenues and reducing reliance on imports. By producing goods locally, the country can save valuable foreign exchange, improve its trade balance, and strengthen its currency. Additionally, the establishment of manufacturing hubs and industrial parks can lead to the development of infrastructure, such as roads, power supply, and communication networks, benefiting the broader economy.

The Nigerian manufacturing industry has long been regarded as a crucial driver of economic growth and industrialization in the country (World Bank, 2021). Its performance, specifically in terms of manufacturing capacity utilization, stands as a significant indicator of its overall health and potential for contributing to economic development (Awolusi & Ayeni, 2019). Manufacturing capacity utilization reflects the extent to which a nation's manufacturing facilities are efficiently used to meet production demands (Onwuka et al., 2018). High capacity utilization signifies efficient operation, with production levels near maximum output. In contrast, low capacity utilization points to underperformance, often due to constraints like inadequate infrastructure, erratic power supply, and limited access to finance. These issues have been persistent challenges in Nigeria, impeding the sector's ability to reach its full potential. Despite the general importance of manufacturing capacity utilization, challenges related to the growth of the manufacturing industry in Nigeria remain significant. These include inconsistent government policies, economic instability, fluctuating exchange rates, and a challenging business environment. These factors exacerbate existing structural issues, preventing the manufacturing sector from operating at optimal levels. Thus, this paper seeks to investigate whether manufacturing capacity utilization could help mitigate the problems hindering the growth of the manufacturing industry in Nigeria particularly in food and beverages, cement and oil refining subsectors. By addressing these constraints, Nigeria could potentially enhance the efficiency and productivity of its manufacturing sector, thereby contributing to broader economic development.

Objectives of the Study

The main aim of this study is to investigate the impact of manufacturing capacity utilization on growth of manufacturing industry in Nigeria. The specific objectives of this study are to:

1. determine the impact of capacity utilization of food and beverages on aggregate manufacturing output in Nigeria.
2. examine the impact of capacity utilization of cement on aggregate manufacturing output in Nigeria.
3. determine the impact of capacity utilization of oil refining on aggregate manufacturing output in Nigeria.

LITERATURE REVIEW

Manufacturing Capacity Utilization

Manufacturing capacity utilization refers to the extent to which a manufacturing facility or industry is utilizing its production capacity at a given point in time. It is a key indicator of efficiency and productivity within the manufacturing sector. The ratio of actual production output to the maximum amount of product that a facility or industry may produce under normal operating circumstances is represented by this statistic, which is often given as a percentage. Low utilisation may point to underutilisation or inefficiencies in the manufacturing process, while high utilisation indicates an effective use of resources (Huang & Nystrom, 2017).

Companies need to align their production capacities with market demands through effective forecasting, investment in technology, and flexible production systems (Sawik, 2018). Additionally, continuous monitoring and adjustment of capacity utilization levels allow manufacturers to adapt to changing market conditions and remain competitive in the global manufacturing landscape. This shows that, manufacturing capacity utilization is a critical metric that reflects the efficiency and health of the manufacturing sector. It serves as a key economic indicator, influencing employment, investment, and overall economic growth. Strategic capacity planning and effective management of demand fluctuations are essential for maintaining optimal capacity utilization and ensuring the long-term sustainability of the manufacturing industry. Notably, in evaluating manufacturing capacity utilization, there are several proxies that offer insights into specific sectors or industries. They are discussed below:

Capacity Utilization of Food and Beverages

The capacity utilization of food and beverages serves as a distinctive proxy for assessing the efficiency and productivity within the food manufacturing sector. This specific metric measures the extent to which the production capacities in food and beverage manufacturing facilities are being utilized. It is a critical indicator considering the significance of the food industry in any economy. The food and beverage sector represent a fundamental component of the manufacturing sector, contributing substantially to employment, consumer spending, and overall economic growth. As such, understanding the capacity utilization within this sector provides valuable insights into the health of the broader manufacturing industry. High capacity utilization in food and beverages suggests robust demand, efficient production processes, and potential economic stability (Hobbs, 2018).

Monitoring the capacity utilization of food and beverages enables policymakers, industry stakeholders, and investors to make informed decisions. For instance, a decline in capacity utilization may signal challenges such as supply chain issues or decreased consumer demand, prompting the need for targeted interventions or policy adjustments to stimulate the sector.

Capacity Utilization of Cement

Capacity utilization of cement refers to the degree to which the production capacities in the cement manufacturing industry are actively employed. It serves as a vital metric, expressed as a percentage, that gauges the efficiency and productivity of cement production facilities in utilizing their maximum potential output under normal operating conditions (Arıkan et al., 2018). This metric is instrumental in assessing the health of the cement manufacturing sector and its contributions to the broader economy.

Furthermore, the capacity utilization of cement holds substantial economic implications, given the integral role of cement in construction and infrastructure development. High capacity utilization in the cement sector is often associated with robust economic growth, increased construction activities, and job creation (Dang et al., 2016). Conversely, low capacity utilization may signal economic downturns, decreased investment in construction projects, and potential challenges within the broader economy. Policymakers closely monitor these trends to formulate strategies that support sustainable economic development.

Capacity Utilization of Oil Refining

Capacity utilization of oil refining encapsulates the measurement of how effectively oil refining facilities are utilizing their production capacities. This essential metric is expressed as a percentage, indicating the ratio of actual output to the maximum potential output under standard operating conditions. It serves as a critical indicator for evaluating the efficiency and productivity of the oil refining sector, a key player in the energy industry (Fattouh et al., 2017).

Given the centrality of the oil refining sector in meeting global energy demands, the capacity utilization within this industry holds profound economic implications. High capacity utilization often aligns with economic growth, increased energy consumption, and enhanced employment opportunities (Alvarez et al., 2020). Conversely, low capacity utilization may signify economic challenges, supply chain disruptions, or shifts towards alternative energy sources, prompting policymakers to assess and adapt energy strategies.

Growth of the Nigerian Manufacturing Industry

The concept of growth in the manufacturing industry refers to the sustained expansion and development of the manufacturing sector within the Nigerian economy. It is a multifaceted measurement encompassing factors such as increased production output, employment generation, technological advancements, and the overall contribution of manufacturing activities to the Gross Domestic Product (GDP) of the nation (Echebiri, 2016; Ogiriki & Atagboro, 2022). The growth of this sector is crucial for economic diversification, job creation, and the overall socio-economic development of Nigeria.

The growth of manufacturing industry in Nigeria holds significant economic implications. A flourishing manufacturing sector contributes to job creation, poverty alleviation, and increased income levels, thereby fostering inclusive economic growth (Echebiri, 2016). Moreover, a vibrant manufacturing industry reduces dependency on imported goods, promotes self-sufficiency, and enhances the resilience of the national economy. The sector's contribution to GDP is a crucial indicator of its overall economic significance, and sustained growth is essential for achieving broader economic development goals (Amankwah-Amoah et al., 2020).

While the Nigerian manufacturing industry has witnessed growth, it faces challenges that impact its full potential. Inadequate infrastructure, policy inconsistencies, and difficulties in accessing finance remain significant hurdles (Ogbeide, 2019). Addressing these challenges presents opportunities for policymakers to implement strategic interventions, including infrastructure development, policy reforms, and financial support, to create an enabling environment for sustained growth. In this paper, measure for manufacturing industry growth, is specifically represented by the aggregate manufacturing output in Nigeria. This serves as a

key indicator in assessing the overall performance and growth of the manufacturing sector within the country. This parameter measures the total production output across various manufacturing sub-sectors, providing a comprehensive snapshot of the industry's growth trajectory over a specific period (Onwioduokit et al., 2019).

Aggregate manufacturing output is of paramount significance in gauging the health and dynamism of the manufacturing sector. It encapsulates the combined production activities of diverse industries, encompassing textiles, food processing, chemicals, and other manufacturing sub-sectors. As such, this proxy is a holistic representation of the contributions of manufacturing to the broader economy, including its impact on GDP, employment, and overall industrial development (Onwioduokit et al., 2019).

Theoretical Framework

Endogenous Growth Theory

Paul Romer and Robert Lucas, two economists, introduced endogenous growth theory, which represents a paradigm change in our understanding of what drives growth in the economy. This theory posits that investment in human capital, technological progress, and innovation are intrinsic and endogenous to the economic system, meaning that growth is not solely reliant on exogenous factors like capital accumulation (Romer, 1986; Lucas, 1988).

In the context of manufacturing, the endogenous growth theory highlights that higher manufacturing capacity utilization plays a pivotal role in fostering sustained economic growth. Increased utilization of manufacturing capacities leads to a surge in economic activities, subsequently prompting greater investments in technology and human capital. This cycle of enhanced production not only stimulates innovation but also encourages the development and application of advanced technologies within the manufacturing sector (Romer, 1986; Lucas, 1988).

In his groundbreaking work "Increasing Returns and Long-Run Growth" (1986), Romer focuses on the concept of increasing returns, asserting that as economies invest more in knowledge and technology, they experience expanding returns, thus breaking away from traditional diminishing returns. Romer's insights highlight that higher capacity utilization in manufacturing serves as a catalyst, triggering a self-reinforcing cycle of innovation and growth (Romer, 1986).

Lucas, in his influential paper "On the Mechanics of Economic Development" (1988), delves into the mechanics of economic growth, emphasizing the role of human capital accumulation. He argues that sustained growth is achievable through investments in human capital, and higher manufacturing capacity utilization contributes to this by creating demand for skilled labour, subsequently fostering technological progress and economic development (Lucas, 1988).

Endogenous growth theory has had a profound impact on economic thought, shifting the focus towards policies that encourage innovation, education, and technological advancements. In the context of manufacturing, the theory underlines the importance of optimally utilizing capacities to drive long-term economic growth, making it a cornerstone in contemporary discussions on economic development.

Empirical Review

Using time series data from 1981 to 2016 and an Autoregressive Distributed Lag (ARDL) model, Okunade (2018) examined the effect of capacity utilisation on the output of manufacturing enterprises in Nigeria. The research discovered a positive but insignificant correlation between manufacturing output and capacity utilisation, which was attributed to the substantial underutilisation of nearly all productive firms in Nigeria. As a result, the research came to the conclusion that significant underutilisation diminished the importance of capacity utilisation in explaining increase in manufacturing output. It suggested that the government and decision-makers take steps to improve capacity utilisation, such raising foreign currency rates, limiting haphazard imports, making it easier for people to get contemporary, reasonably priced gear, and giving Nigeria's steady power supply first priority.

GDP was the main emphasis of Okeoma et al.'s (2022) analysis of the impact of manufacturing capacity utilisation on Nigeria's economy. From 1981 to 2021, the research examined the connection between GDP, the Manufacturing Productivity Index (MPI), and capacity utilisation (CU). The Central Bank of Nigeria (CBN) Statistical Bulletin and other pertinent government institutions provided the data, which were then analysed using E-views 8 econometric models. The findings showed a substantial and positive correlation between the industrial capacity indicators and economic growth. According to the report, the government should launch major industrial initiatives to support local procurement of intermediate goods and raw materials. Doing so would ease the process of backward integration, lower production costs, create jobs, and improve the competitiveness of goods made locally.

Afolabi and Laseinde (2019) examined how Nigeria's manufacturing sector output affected the country's economic growth between 1981 and 2016. The Autoregressive Distributed Lag (ARDL) model and Granger causality techniques were used to analyse the following: RGDP, manufacturing capacity utilisation (MCU), manufacturing output (LMO), government investment expenditure (GINVEXP), money supply (LM2), and interest rate (INR) using secondary data from the Central Bank of Nigeria's statistical bulletin. The results showed both long- and short-term correlations between these variables, with RGDP being favourably impacted by MCU and LMO, adversely impacted by GINVEXP, and positively impacted by LM2. RGDP and MCU, LMO, and LM2 were likewise revealed to be causally related in a unidirectional manner. Based on these findings, the research recommended that in order to foster positive relationships within the manufacturing sector, the government improve macroeconomic policies, institutional frameworks, and socio-economic infrastructure.

Oniyide and Ogunjinmi (2021) used yearly data from 1980 to 2018 from the World Development Indicators (WDI) and the Central Bank of Nigeria Statistical Bulletin to investigate the impact of manufacturing capacity utilisation on economic development in Nigeria. The research examined how industrial capacity utilisation responded to GDP shocks using impulse response functions, Johansen cointegration, and canonical cointegration methodologies. A long-term link between the variables was shown by the Johansen cointegration findings. The empirical findings showed that, in the first model, manufacturing capacity utilisation had a little negative impact on GDP; but, in the succeeding models, GDP rose considerably with time. The research came to the conclusion that in order to fully realise

the manufacturing sector's potential for economic growth and development, the government needed to set up an institutional framework.

The difficulties developing nations have in enhancing the performance of the manufacturing sector were examined by Kojo et al. (2020), with an emphasis on capacity utilisation and infrastructural development. Their research looked at how Nigerian industrial value addition was affected by capacity utilisation and infrastructural development between 1980 and 2019. The study found that capacity utilisation and capital expenditure had positive and significant effects on manufacturing value added, while electricity had a negative and insignificant effect. Other variables used in the analysis included average capacity utilisation, government capital expenditure, and the annual percentage growth in manufacturing value added. The findings demonstrated how increasing social and economic infrastructure might raise the value added in manufacturing.

The objective of Singh et al. (2021) was to evaluate the role that capacity and capacity utilisation (CU) play in raising standards of quality and output in industrial settings. The research carried out an extensive analysis of the literature on CU, concentrating on different estimating techniques and contemporary international practices. It was said that rather than being estimated at the industry level, CU is usually calculated at the national or sector level by government or central bodies. In order to detect and solve capacity waste inside facilities, the report stressed the need of good capacity management at the industry level. It examined several CU estimating techniques, including as survey, time series, economic, and engineering methods, and offered advice on how to maximise resource use to boost output.

METHODOLOGY

This paper employed an *ex-post facto* research design. *Ex-post* facto research involves a systematic empirical inquiry wherein the researcher lacks direct control over variables due to their prior occurrences or inherent non-manipulability. In this study, the variables are derived from the annual reports of the Central Bank Statistical Bulletin, making them beyond the direct manipulation or control of the researcher. The population encompassed the comprehensive data on manufacturing capacity utilization and manufacturing growth in Nigeria, covering the period from 1995 to 2023. This research employed secondary data extracted from Central Bank of Nigeria (CBN) Statistical Bulletin for the year 2023. The data obtained was analysed descriptively and inferentially.

Model Specification

To encapsulate these variables in the study, the model is expressed in a functional form as presented below:

Y = f (Explanatory variables) + error term (i)

Where Y = Dependent Variable "Growth of manufacturing sector"

X = Independent Variable which was represented by Capacity Utilization of food and beverages, Capacity Utilization of cement, and Capacity Utilization of oil refining.

The multiple linear regression models for this study are defined as:

$Y= \beta_0 + \beta_1X_1+\beta_2X_2 +\beta_3X_3+ \mu$ (ii)

$MSOPT = \beta_0+\beta_1CPUFB_{t1}+\beta_2CPUCM_{t2}+\beta_3CPUOR_{t3}+ \mu$ (iii)

Where:
β_0 = Constant
β_1- β_3 = Intercepts
μ = Error term
MSOPT = Manufacturing sector output
CPUFB = Capacity Utilization of food and beverages
CPUCM = Capacity Utilization of cement
CPUOR = Capacity Utilization of Oil Refining

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1 presents a summary of the descriptive analysis findings encompassing all variables examined in the study. It outlines key statistical measures including the mean, median, maximum, minimum, standard deviation, and the count of observations for each variable.

Table 1: Descriptive Statistics Result

	MOTP	CPUFB	CPUCM	CPUOR
Mean	4340.452	57.46804	47.09007	48.16493
Median	3491.294	63.00000	46.89950	46.06148
Maximum	6684.218	75.75000	72.00000	90.50000
Minimum	1797.292	12.70000	31.40000	20.25000
Std. Dev.	1600.840	15.30366	10.47191	14.97138
Skewness	0.423310	-1.358259	0.702511	0.916970
Kurtosis	1.521813	4.355565	2.952570	4.185043
Jarque-Bera	3.506347	11.13725	2.388070	5.760923
Probability	0.173223	0.003816	0.302996	0.056109
Sum	125873.1	1666.573	1365.612	1396.783
Sum Sq. Dev.	71755282	6557.659	3070.504	6275.978
Observations	116	116	116	116

Source: Eview 10

The descriptive statistics reveal insightful patterns and characteristics of the variables under scrutiny. Firstly, the manufacturing sector output (MOTP) demonstrates a substantial mean value of ₦4340.452 billion, with a median slightly lower at ₦3491.294 billion, indicating a distribution skewed towards higher values. This is further corroborated by the fact that the lowest number, ₦1797.292 billion, represents times of lesser output, while the largest value, ₦6684.218 billion, indicates sporadic peaks in productivity. A standard deviation of ₦1600.840 billion highlights the range of production around the mean. The food and beverage sector (CPUFB) has a mean of 57.46804% and a median of 63.00000% for capacity utilisation. The skewness of -1.358259 indicates a negative skew, indicating a trend towards higher levels of capacity utilisation. The cement sector (CPUCM), on the other hand, has a skewness of 0.702511, suggesting a minor positive skew, with a mean of 47.09007% and a median of 46.89950%. The distribution of the oil refining industry (CPUOR) is well balanced, with a mean of 48.16493% and a median of 46.06148%. Further information on the morphologies of the distributions may be obtained from the skewness and kurtosis values. The Jarque-Bera test evaluates the normality of the data and identifies deviations from it, especially in CPUFB. All things considered, these statistics provide a thorough explanation of the variables' distribution

shapes, core trends, and variability, which improves comprehension of their behaviour and their ramifications.

Regression Analysis

This section presents the results of the regression analysis, specifically using ordinary least squares (OLS), for the independent and dependent variables.

Table 2: OLS Regression Result

Dependent Variable: MOTP
Method: Least Squares
Date: 02/06/24 Time: 15:34
Sample: 1995 2023
Included observations: 116

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3224.324	1425.089	2.262542	0.0326
CPUFB	56.47717	18.35984	3.076126	0.0050
CPUCM	-61.74223	25.69648	-2.402751	0.0240
CPUOR	16.15162	17.84183	0.905267	0.3740

R-squared	0.570192	Mean dependent var	4340.452
Adjusted R-squared	0.494615	S.D. dependent var	1600.840
S.E. of regression	1344.501	Akaike info criterion	17.37288
Sum squared resid	45192057	Schwarz criterion	17.56147
Log likelihood	-247.9067	Hannan-Quinn criter.	17.43194
F-statistic	4.898211	Durbin-Watson stat	1.004814
Prob(F-statistic)	0.008187		

Source: Eview 10

Interpretation Based on Coefficient:

Capacity Utilization of Food and Beverages*:* The findings indicate that Nigeria's manufacturing sector output is favourably impacted by capacity utilisation in the food and beverage industry. In particular, the coefficient of 56.47717 shows that, while all other factors remain same, a 1% increase in capacity utilisation in this industry results in a 56.47717 percent increase in manufacturing sector output.

Capacity Utilization of Cement: The data demonstrates that Nigeria's manufacturing sector output is adversely impacted by capacity utilisation in the cement industry. The coefficient of -61.74223 shows that, when all other factors are kept equal, a 1% increase in cement capacity utilisation results in a 61.74223 percent decline in manufacturing sector output.

Capacity Utilization of Oil Refining: A coefficient of 16.15162 further supports the findings, which show a positive association between Nigeria's manufacturing sector output and capacity utilisation in oil refining. This indicates that, while all other factors are kept equal, a one-unit

increase in oil refining capacity utilisation leads to a 16.15162 percent increase in manufacturing sector output.

Interpretation Based on R^2: With an R^2 of 0.570192, the model's independent variables account for 57% of the variance in Nigeria's manufacturing sector output. The error term accounts for 43% of the variance, which is attributable to other external variables. This implies that misspecification errors are not present in the model. The model's goodness of fit is supported by the significant Prob(F-statistic) value of 0.008187, which is significant at the 5 percent level, and the F-ratio statistic of 4.898211, which is larger than 2. As a result, it can be said that all of the independent factors together have an enormous effect on Nigeria's manufacturing sector development. The research shows that the performance of manufacturing companies in Nigeria is greatly impacted by the use of manufacturing capacity.

Testing of Hypotheses

Results that were significant at the 5% level were highlighted by the E-Views software. If the p-value is less than or equal to 0.05, the alternative hypothesis is accepted; if not, it is rejected. The following hypotheses are put to the test:

Hypothesis 1: There is no significant impact of capacity utilization of food and beverages on aggregate manufacturing output in Nigeria.

The food and beverage industry's capacity utilisation has a t-statistic of 3.076126 and a p-value of 0.0050, both of which are less than the 5% significance threshold. This suggests a significant and statistically meaningful impact between the variables analyzed. Consequently, the null hypothesis is rejected, indicating that capacity utilisation in the food and beverage industry has a significant impact on Nigeria's overall manufacturing output.

Hypothesis 2: Capacity utilization of cement has no significant impact on the aggregate manufacturing output in Nigeria.

The capacity utilization of cement displays a t-statistic of -2.402751 and a p-value of 0.0240, falling below the 5% significance threshold. This demonstrates a significant, albeit negative, relationship between the variables in question. Consequently, the null hypothesis is rejected, affirming that the capacity utilization of cement significantly influences the overall manufacturing output in Nigeria.

Hypothesis 3: Capacity utilization of oil refining has no significant impact on the aggregate manufacturing output in Nigeria

Cement capacity utilisation has a t-statistic of 0.905267 and a p-value of 0.3740, both of which are below the 5% significance threshold. This suggests that there is a positive but statistically insignificant correlation between the variables under investigation. Consequently, the acceptance of the null hypothesis suggests that the utilisation of cement capacity has no significant impact on Nigeria's total manufacturing output.

Discussion

The study examined the impact of manufacturing capacity utilization in Nigeria and its implications for manufacturing sector performance finds significant resonance with both theory and a spectrum of empirical literatures, establishing a comprehensive dialogue between theoretical frameworks and real-world observations. The positive correlation between capacity utilization in certain sectors and overall manufacturing output, as well as the nuanced challenges highlighted by the negative impact in others, such as the cement sector, aligns closely with the broader discourse on economic development and manufacturing efficacy.

The results of our investigation align with the tenets of Paul Romer and Robert Lucas's Endogenous Growth Theory. According to this idea, internal forces like technical innovation, investments in human capital, and efficient use of resources are what primarily propel economic development. This idea holds that developing a variety of businesses and promoting sustainable economic growth need increased capacity utilisation in the manufacturing sector. This is because higher utilization rates lead to enhanced economic activities, which in turn encourage greater investments in technology and human capital. These investments foster a virtuous cycle of innovation and productivity improvements within the manufacturing sector.

The positive impacts of capacity utilization in the food and beverages and oil refining sectors found in our study exemplify the theory's assertion that optimizing manufacturing capacities can significantly contribute to economic expansion. This optimization not only stimulates innovation but also necessitates the adoption of advanced technologies and processes, thereby enhancing overall productivity and growth.

Our findings on the negative effects of capacity utilization in the cement sector highlight the nuanced challenges within different manufacturing subsectors. This is supported by the finding of Okunade (2018), which highlight the substantial underutilization in Nigerian manufacturing firms, thus suggesting that targeted interventions are needed to harness the full potential of capacity utilization in stimulating economic growth

The empirical findings from Okunade (2018), which highlight the substantial underutilization in Nigerian manufacturing firms, echo our study's insights into the challenges and potential within the cement sector. This underutilization, as discussed by Okunade, underscores the critical need for policies aimed at enhancing capacity utilization—a strategy that our findings support, particularly in the context of food and beverages, and oil refining sectors. The alignment here suggests a shared understanding of the pivotal role of capacity utilization in unlocking the manufacturing sector's contribution to economic growth.

Moreover, the work of Okeoma et al. (2022), Afolabi and Laseinde (2019), alongside Oniyide and Ogunjinmi (2021) which identifies a strong positive relationship between manufacturing capacity utilization and GDP, further complements our study's findings. The correlation they describe supports our observations regarding the significant, positive impacts of optimized capacity utilization in the food and beverages and oil refining sectors in the current study. These findings resonate with our observations on the beneficial effects of increased capacity utilization in fostering innovation, productivity, and, ultimately, economic growth, highlighting a consistent theme across empirical studies that enhanced capacity utilization serves as a linchpin for economic development. This study not only contributes to the existing body of

knowledge by providing empirical evidence from the Nigerian manufacturing sector but also aligns with and extends the discussions within the empirical literature.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study concludes that manufacturing capacity utilization has a significant impact on the growth of the Nigerian manufacturing industry. The culmination of our study underscores a pivotal finding: the efficiency of manufacturing capacity utilization significantly influences economic growth in Nigeria, resonating deeply with both Endogenous Growth Theory and a broad array of empirical literature. This study not only highlights the nuanced impacts of capacity utilization across different sectors—demonstrating positive effects in the food and beverages and oil refining sectors, and a negative impact in the cement sector—but also sets a compelling argument for targeted policy interventions. By aligning our findings with the seminal works of Romer and Lucas, as well as corroborating evidence from contemporary researchers, our analysis reinforces the critical role of optimizing manufacturing operations as a catalyst for sustained economic advancement. It underlines the necessity for policies that not only encourage improvements in manufacturing capacity utilization but also foster innovation, technological progress, and human capital development. In essence, our study contributes to the ongoing dialogue on economic development strategies, advocating for a holistic approach that integrates sector-specific insights with broader economic objectives to propel Nigeria towards enduring economic prosperity.

Recommendations

In light of the findings of the study, the following recommendations are put forward to enhance the utilisation of manufacturing capacity and, as a result, stimulate economic growth in Nigeria:

1. Given the positive impacts of capacity utilisation in the food and beverage industry, it is recommended that stakeholders and the government encourage investments in cutting-edge techniques and technology. This might include providing tax breaks to firms who make investments in energy-saving equipment or use sustainable manufacturing techniques, enhancing both environmental sustainability and productivity.
2. The negative impacts seen in the cement sector suggest that legislative changes are necessary in order to reduce production costs and boost competitiveness.
3. To leverage the positive correlation between capacity utilization and economic output in the oil refining sector, significant investment in modernizing existing refineries and potentially constructing new ones is essential. This would address efficiency issues, reduce import reliance, and enhance domestic capacity utilization.

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