GROSS FIXED CAPITAL FORMATION AND INDUSTRIAL DEVELOPMENT IN NIGERIA

Boloumbele Yalah, PhD[1]; Stanley Ogoun, PhD[2];

[1&2]Department of Accounting, Faculty of Management Sciences,
Niger Delta University, Wilberforce Island, Amassoma, Bayelsa State, Nigeria. E-mail: yalahb18@yahoo.com.

Abstract

It is clear that industrialization is the backbone of the economic progress of any country, be it a capitalist, socialist, or mixed economy. Anchored on this premise, gross fixed capital formation and its bearing on industrial development was explored in this work. Relying on secondary data spanning twenty years (2001-2021) sourced from the Nigerian Exchange Group (NGX) statistical bulletin, the ex post facto research model was adopted. The aggregate data obtained was analyzed via the inferential statistical tool of regression. Following, it was observed that the current level of Nigeria's gross fixed capital formation has not contributed to industrial growth. This finding aligns the poor performance of the real industrial sector over the years as reported by National Bureau of Statistics. Therefore, it is suggested that policymakers should craft and implement investor-friendly policies to boost capital inflows towards boosting the fixed capital stock that will stimulating industrial growth.

Key Words: Gross fixed capital formation, Industrial Development, Nigeria, Stock Market.

Introduction

Through the creation of industries- large and small, a country can produce most of the goods and services that its people need. Economists of various schools of thought agree that one of the parameters used to measure a country's level of development is the extent to which it can provide for its citizens' basic goods and services necessary for a good life in society. Developing countries, like Nigeria, are in dire need of industrialization today because they want to achieve economic autonomy (Udofia, Onwioduokit & Effiong, 2022). Indded, industrialization is at the epicenter of national socio-economic development. The strive for industrialization at in-country level is a global aspiration. Overall, citizens' wellbeing and the global ranking of nations on the development index is anchored on national industrial growth. This as countries are designated as developed, developing or underdeveloped based on industrial output. The significance of industrial development at the in-country level for relevance in global geopolitics resonates around the globe. The broad conclusion is that no country can survive without national industrial growth. National industrial development holds the ace for favourable balance of payment in international trade as well as exchange value of a country's domestic currency. The menacing status of China in global politics was instigated by its industrial development. The sharp and often bitter trade wars that dot the globe

economic space are contested amongst industrialized nations. Others are mere takers and observers. Therefore, industrialization is at the core of every national aspiration such that, even the developed ones are not relenting in the forward push.

The path to national industrial development embodies various strategic tools that coalesce to engender the desired state. Strategic actions taking along the path will gradually scale up industrialization. Opudu and Ogoun (2023a & 2023b) have indicated the importance of gross fixed capital formation to Nigeria's developmental aspiration, in addition to blocking illicit flows of funds towards shoring up the quantum of gross capital. In the toolkit for accumulating capital is the stock market. It plays a crucial role in raising capital, allocating resources, monitoring managers, and facilitating risk management. However, recent economic growth theory has shifted focus from traditional factors to include financial and stock market trends, macroeconomic environment, political stability, and foreign direct investment. Udofia et al. (2022) argued that industrial development can break poverty and underdevelopment cycles. The capital market, as the primary source of financing for developing countries, plays a crucial role in ensuring effective industrialization. The market provides large amounts of debt-free long-term money through the issuance of shares, allowing new industrial facilities to withstand the relatively long gestation period of most capital investment projects. This ensures that the capital market plays a crucial role in promoting economic growth and overcoming poverty.

Nigeria, a developing country, faces challenges in underdeveloped stock markets, limiting the role of financial institutions and leading to slower economic growth. The government maintains high interest rates and provides subsidized loans for frivolous investments, which undermines sustained economic growth. The National Bureau of Statistics (2020) reports that economic growth has slowed due to decline in industrial activities. In 2015 and 2020, the economy bottomed out at an average of -6.0%, compared to 2.5% in 2011. The declines are attributed to the oil sector shocks and the COVID-19 pandemic. Despite the fact that the stock market driving global economic growth, Nigeria's stock market has not performed well enough to realize its full potential.

There are conflicting opinions on the relationship between gross fixed capital formation and economic growth in the literature. Some authors argue that there is a positive relationship (Boamah, Adamo, Essieku & Lewis Jr., 2018; Nweke, Odo & Anoke, 2017; Bal, Dash & Subhasish, 2016, Bakare, 2011), while others hold the opposite view (Kanu & Nwaimo, 2015; Muhammad, Sallahuddin & Nor, 2016; Ajose & Oyedokun, 2018; Onwiodiokit & Otlorin, 2021). This contradictory finding calls for more investigations.

By utilizing a data set spanning twenty years, this establishes the core objective of the study, which is to investigate the connection between gross fix capital creation and industrial development.

H_{o1}:   Gross fixed capital formation does not have significant effect on industrial production index in Nigeria.

Literature Review
Gross Fixed Capital Formation
Gross Fixed Capital Formation (GFCF) is a macroeconomic concept that measures the total value of physical assets produced within an economy over a year, excluding those that are retired or depreciated. It represents the net increase in a country's stock of physical capital. One of the most important factors in boosting the economy and creating jobs is gross fixed capital, according to the Foreign Development Institute (2016). Tobin (1965) cites Keynes's argument that aggregate demand rises as a result of fresh and increased investment. Both new and current domestic investors can boost investment when they put money into the market (Faulkner, Loewald, & Makrelov, 2013). Because it raises aggregate demand, gross fixed capital development is essential to job creation and economic expansion. According to Keynes, fresh investment increases aggregate demand, and domestic investment rises when both established businesses and individuals invest more money at home.

Industrial Development
Industrial capabilities are crucial for economic development, distinguishing developed and developing economies. An appropriate industrial base combines technology management techniques and resources to transition from traditional production to an efficient system of mass processing and manufacturing (Idyu, Ajekwe, and Korna, 2014). Because of this, once an economy becomes industrialized, it always looks for ways to grow. Having easy access to long-term finance is crucial for enterprises to flourish for industrialization to take place. Thus, once an economy has industrialized, it always aspires to grow.

Theoretical Framework
Economic Growth Theory
Four pillars support Schumpeter's theory of economic development and growth: cyclical process, entrepreneurial function, circular flow, and the demise of capitalism. The idea of circular flow in economics is that, in a completely competitive market, production occurs at a constant pace all the time. The transfer of land and labor power results in money, which in turn allows for the fulfillment of demands, bringing about this balance. The economy, according to Schumpeter's theory, stays in a constant state of equilibrium unless new innovations disrupt it. According to Schumpeter (2011; 1934), the person who starts and continues a society's growth is the entrepreneur or innovator. Entrepreneurship is distinct from administrative tasks since it involves creating something new, as well as from capitalist endeavors because capitalists do not supply funding for entrepreneurs. In line with what Andersen argues, Schumpeter posits that economies go through business cycles marked by expansion and contraction (2009). The known fact that persistent industrial progress leads to economic development forms the basis of the preceding hypothesis, which in turn informs this investigation.

Hypothesis Development

Also, Opudu and Ogoun (2023a) explored the role of Suspicious Transactions Reports (STR) as an anti-money laundering instrument on capital formation in Nigeria. The rationale for the study was hinged on the Nigerian Money Laundering Act 2011 and Financial Action Task Force (FATF, G7). Theoretically founded on the financial surveillance theory, quarterly data was sourced from the Nigeria Inter-Bank Settlement Scheme (NIBSS), Nigeria Financial Intelligence Unit Activity Reports (NFIU), and CBN Statistical Bulletins for the study. Subjecting data to descriptive and inferential statistical analyses, the study observed that that STR has positive significant effect on capital formation in Nigeria and recommended that STR instruments be energized.

Opudu and Ogoun (2023b) looked on the impact of Nigeria's money laundering conviction rate on capital development. Modern deterrence theory informed the conclusions of this study, which relied on data collected from the Central Bank of Nigeria (CBN), the Economic and Financial Crimes Commission (EFCC), and the Nigerian Financial Intelligence Unit (NFIU). In order to examine the data, the Error Correction Model (ECM) was used. According to the findings, the current money laundering conviction rate (MLCR) has a small but unfavorable impact on capital formation in Nigeria. Hence, it calls for the legal system in Nigeria to be fortified, for political involvement in the EFCC, ICPC, and NFIU's work to be further eradicated, and for the establishment of inter-agency cooperation to be put into effect.

Using the dynamic ordinary least squares (DOLS) method on yearly time series data from 1981 to 2018, Onwiodiokit and Otlorin (2021) reevaluate the effect of gross fixed capital creation on economic development in Nigeria. Gross fixed capital formation significantly and negatively affects economic growth, according to DOLS research. The findings also demonstrate that total labor force participation and external debt both hinder economic expansion. However, interest rates and gross capital formation have both contributed to Nigeria's economic growth.

The impact of the currency rate on a country's financial development was investigated by Ogoun and Adumein (2020) with Nigeria as a case study. Based on thirty-six years of time series secondary data from the Debt Management Office (DMO), the CBN Statistical Bulletins, and the NSE, the study found that a country's currency exchange rate influences financial deepening and, by extension, the capital formulation for national development. The data was analyzed using ordinary least square (OLS). The study posits that the level of industrial development should shape exchange rate policy strategy. Also, that efforts should be intensified at boosting industrial development for export gains.

Adumein and Ogoun (2020) inquired into the influence of external debt management on Nigeria's financial dept. In order to measure financial deepening and the stock of external debts, it used data from the following sources: the DMO, the CBN Statistical Bulletins, the NSE, and the World Bank. The data was based on the ratio of the broad money supply to GDP (M2/GDP). Borrowing boosts available finances in the short term, but poorly managed borrowing eventually hurts the economy, according to the

study's OLS analysis. Accordingly, the research found that the country's financial system had not advanced over the study period due to borrowing from outside sources. That is why it says that only productive activities should get foreign loans. In addition, it firmly established the need of enhancing good governance and protecting borrowed money from illegal leakages.

In their 2018 study, Boamah, Adamo, Essieku, and Lewis Jr. looked at 18 Asian nations to see how financial depth, GDP growth, and gross fixed capital creation were related. Panel data collected between 1990 and 2017. Gross fixed capital creation and financial depth significantly affect economic development, according to their analysis. Although increases in gross fixed capital creation boost economic development, deepening financial pockets slow things down. Economic growth was positively impacted by net FDI inflows, according to their findings. They recommended putting more money into gross fixed capital and foreign direct investment.

Ajose and Oyedokun (2018) used Granger causality to look at the relationship between capital accumulation and economic development in Nigeria from 1980 to 2016. There is a strong long-run relationship between the studied variables, and the research period demonstrated a causal relationship between capital accumulation and economic growth in Nigeria. Additionally, researchers in Nigeria discovered a negative, albeit statistically insignificant, link between GDP growth and CF. The study's authors concluded that Nigerian policymakers could make investment more attractive by passing investor-friendly legislation.

Nweke, Odo, and Anoke (2017) looked at how capital production affected GDP growth in Nigeria. Their experimental results using the Vector Cointegration and Error Correcting Model (VECM) show that total capital formation (GBF) has a minor but positive effect on gross national product (RGDP) in the short and long run.

Bal, Dash, and Subhasish (2016) examined the impact of capital creation on India's economic development from 1970 to 2012 using an autoregressive distributed lag (ARDL) technique. The research demonstrates a long-term connection for all of the control variables. Growing the economy and accumulating wealth. The research shows that while inflation has a negative effect on GDP in the near term, capital formation, exchange rate, trade openness, and factor productivity all have beneficial effects on growth. They think that if the government wants to speed up economic development, it should increase capital formation.

Muhammad, Sallahuddin, and Nor (2016) examined the effects of Nigeria's external debt on GDP growth and capital formation development from 1980 to 2013. There is a negative correlation between foreign debt and capital formation, according to the statistics. Even at modest interest rates, the results demonstrated statistical significance. On occasion, additional variables have a unidirectional impact. Furthermore, the short-term dynamics of the variable-to-variable relationship were investigated using the ARDL error correction model. In order to speed up the development of capital production in the economy, the findings emphasize the importance of internal savings

incentives.

Kanu and Nwaimo (2015) examined the expenditure on capital expenditures and total fixed capital formation in Nigeria from 1981 to 2011. In order to analyze the collected data, least-squares regression analysis was used. In Nigeria, total fixed capital formation (GFCF) has a negative correlation with capital expenditure (CAPEX) in the medium and long term, but a positive correlation with domestic saving. The Federal Government of Nigeria should decrease recurring expenditures and raise CAPEX, according to this paper's conclusion, if total fixed capital is to be sustained.

The impact of gross capital creation on CEMAC sub-regional economic development was also investigated by Ongo and Vukenkeng (2014). It took its cues from the endogenous growth paradigm. The research begins with data culled from the Development Indicators maintained by the World Bank. This study employed the Generalized Least Square estimation approach for its estimate needs. Private investment is positively associated with economic growth, according to the data. This is equally true for developments in infrastructure and technological advancements. Ironically, this sub-region's economic progress is often dampened by the labor force. Evidence like these suggests that the nations in the subregion need workable job initiatives.

Using statistics spanning 1970–2007, Orji and Mba (2012) investigated the relationships between capital formation, economic growth, and FDI in Nigeria. The two-step least squares method (2SLS) states that, compared to their short-term effects, capital formation and foreign private investment's long-term effects on economic growth are more significant. Bakare (2011) examined the relationship between capital creation and GDP growth in Nigeria using annual data from 1979 to 2009. Using the Johansen and ECM cointegration estimation techniques, the research discovered a substantial association between GDP growth and capital formation in Nigeria.

Malaysian researchers Karim, Karim, and Ahmad (2010) looked at how GDP growth, fixed investment, and consumer spending all relate to one another. The Structural Vector Error Correction (SVAR) model was used to determine that fixed investment and household consumption significantly impact economic growth. The effects of fixed investments are mostly immediate. The study's other results imply that demand-side policies that influence consumer spending and business investment do nothing to boost economic expansion.

Methodology

The study used ex-post facto research design. In order to understand the behavioral link between the variables being studied, the design is chosen after data on past events is analyzed. The aggregate contribution of all the industrial sectors is taken into consideration, which does not require the selection of a representative sample to obtain data from and draw inference pursuant to the study's outcome, but rather obtaining data from all the population elements of the study. Also, the study gathers its data source from the Nigerian Exchange Group statistical bulletin from 2001-2021. The data obtained was scrutinized using the Pearson correlation analytical tool.

Gross Fixed Capital Formation and industrial growth in Nigeria were estimated using an econometric model that was slightly modified from the one used by Onwiodiokit and Otolorin (2021). Thus, industrial development trend model for Nigeria can be specified in a functional form as:

logINPI = f (logGFCF, logINTR)

In econometric term, the model is:

logINPI = β0 + β1 logGFCF + β2 logINTR + e

Where:

INPI = Industrial Production Index

GFCF = Gross Fixed Capital Formation

Control Variable

INTR = Interest Rate

e = Error Term

Result and Discussion

Table 1: Descriptive Statistics

	LOGINPI	LOGGFCF	LOGINTR
Mean	3.229087	1.846675	1.714106
Median	3.322515	2.066863	1.801710
Maximum	4.165269	3.707210	2.900322
Minimum	1.000632	-0.579820	0.067659
Std. Dev.	0.751242	1.132230	0.775997
Skewness	-1.223065	-0.580287	-0.722832
Kurtosis	4.657292	2.856725	2.766586
Jarque-Bera	7.638901	1.196526	1.876373
Probability	0.021940	0.549766	0.391337
Sum	67.81084	38.78018	35.99622
Sum Sq. Dev.	11.28728	25.63890	12.04342
Observations	21	21	21

Source: *E-views Output*

Table1 shows that the industrial development index (INPI) ranges from 1.000632 to 4.165269 per annum, with an average value of 3.229087. A kurtosis value of 4.657293 indicates a leptokurtic distribution, a standard deviation of 0.751242 suggests a considerably distanced series from the mean, and a skewness value of -1.223065 indicates a negatively skewed distribution. With a mean of 1.846676 and a standard deviation of 1.1322229, the Gross Fixed Capital Formation (GFCF) series does not deviate significantly from its mean. Values in the series range from 0.579818 to 3.707210. A skewness score of -0.580285 and a kurtosis value of 2.856723 indicate that the distribution is not leptokurtic and is not negatively skewed.

Throughout the specified time frame, the average interest rate (INTR) was 1.714106, with a standard deviation of 0.775997 and extremes of 2.900322 and 0.067659, respectively. With a value of 0.722832, the distribution is negatively skewed; with a

value of 2.766586, it is leptokurtic.

Correlation Analysis

Table 2: Correlation Analysis on Gross Fixed Capital Formation and Industrial Development

Correlation			
Probability	LOGINPI	LOGGCFC	LOGINTR
LOGINPI	1.000000		

LOGGCFC	-0.354545	1.000000	
	0.1148	-----	
LOGINTR	0.029870	-0.042857	1.000000
	0.8977	0.8537	-----

Source: Desk research using E-views output (2023)

From the Pearson correlation analytical outcome, there exists a weak negative relationship between INPI and GCFC) with value of -0.354545, suggesting that a decrease in the trading of shares in the Nigerian Exchange Group would spark a one percent decline in industrial production index.

Table 3: Regression Result
Dependent Variable: LOGINPI
Method: Least Squares
Date: 08/24/23   Time: 13:20
Sample: 2001 2021
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.574756	0.505280	7.074805	0.0000
LOGGFCF	-0.191236	0.149938	-1.275438	0.2184
LOGINTR	0.004365	0.218769	0.019955	0.9843

R-squared	0.083225	Mean dependent var	3.229087
Adjusted R-squared	-0.018639	S.D. dependent var	0.751242
S.E. of regression	0.758210	Akaike info criterion	2.415852
Sum squared resid	10.34789	Schwarz criterion	2.565069
Log likelihood	-22.36644	Hannan-Quinn criter.	2.448236
F-statistic	0.817022	Durbin-Watson stat	1.157600
Prob(F-statistic)	0.457472		

Source: E-views Output

Gross fixed capital creation, as described in Table 3, has a calculated level of significance value of 0.2184, which is not significant at 0.05. As a consequence, we accept the null hypothesis and reject the alternative hypothesis. At the 5% significant level, the p-valueiof 0.2184 reveals that there is no significant influence on Gross fixed capital creation on industrial growth in Nigeria. From the result pan out, as suggested by the result of Ho1, gross fixed capital formation (GFCF) has a negative influence on industrial growth in Nigeria within the period of the research. This is consistent with a priori assumptions; with a negative coefficient of -0.077007, it suggests that a 1% drop in GFCF will result in an INPI rise of around -0.077007%. The finding replicates that from the National Bureau Statistics which is symptomatic of the persistent fall in industrial growth in the nation since the structural adjustment programme and the concomitant depreciation of the naira. Furthermore, from an empirical literature, this conclusion is compatible with the findings of Muhammad, et al., (2016); Ajose and Oyedokun, (2018); Onwiodiokit and Otlorin (2021), who claimed that there is a negative link between gross capital formation and industrial growth. The study of Boamah, et al., (2018); Nweke, et al., (2017) Bal, et al., (2016) found positive significant link with economic growth.

Several arguments have been adduced to explain the large negative contribution of gross capital formation to the index of industrial output in the short and long run. High rate of corruption, rising inflation, high exchange rate and poor in-country infrastructure and hostile business climate. There had been a steady decline in industrial production, evidenced by the exit of most companies operating in the real sector. A successful economy relies on a system for transferring surplus cash from sales to investors, who spend more than their immediate incomes. Financial markets help lenders mobilize short and long-term capital resources, allowing them to be allocated to the needed regions. Key to the expansion of the Nigerian economy is the increase in financing for industrial output.

Conclusion and Recommendations

Following the study concludes that gross capital formation in Nigeria has not translated to industrial development. Therefore, it is advocated that policymakers should craft and implement investor-friendly policies to boost capital inflows towards boosting the fixed capital stock that will stimulating industrial growth. The implication of the giving traction to such policies is that it would bring about a change in the country-level narrative of the absence of industrial stimulation via capital formation, as evidenced in other climes.

References

Adumein, W. G., & Ogoun, S. (2020). External debt management and financial deepening: a causal analysis. *International Journal of Economics, Commence and Management, 8*(2), 9-19.

Ajose, K., & Oyedokun, G. E. (2018). Capital formation and economic growth in Nigeria. *Accounting and taxation review, 2*(2), 131 - 142.

Andersen, E. S. (2009). Schumpeter's evolutionary economics: A theoretical, historical and statistical analysis of the engine of capitalism. - Anthem Press

Bakare, A. S. (2011). A theoretical analysis of capital formation and growth in Nigeria. *Journal of Psychology and Business*, *3*(2), 11-24.

BaL, D., Dash, D., & Subhasish, B. (2016). The effects of capital formation on economic growth in India: evidence from ARDL-bound testing approach. *Global Business Review*, *17*(6), 1388 -1400.

Boamah, J., Adongo, F. A., Essieku, R., & Lewis Jr., J. A. (2018). Financial depth, gross fixed capital formation and economic growth: Empirical Analysis of 18 Asian Economies. *International Journal of Scientific and Education Research*, *2*(04), Available at SSRN: https://ssrn.com/abstract=3424688 or http://dx.doi.org/10.2139/ssrn.3424688

Faulkner, D., Loewald, C., & Makrelov, K. (2013). Achieving higher growth and employment: Policy options for South Africa. *South African Reserve Bank Working Paper*, *13*(3), 1-35.

Idyu, I. A., Ajekwe, T., & Korna, J. M. (2013). The capital market and industrial Production in Nigeria. IOSR *Journal of Business and Management*, *10*(6), 81-103.

Kanu, S. I., & Nwaimo, C. E. (2015). Capital expenditures and gross fixed capital formation in Nigeria. *Research Journal of Finance and Accounting*, *6*(12), 188-197.

Karim, Z. A., Karim, B. A., & Zaidi, M.A.S. (2012). Fixed investment, household consumption, and economic growth: A structural vector error correction model (SVECM) study of Malaysia. *International Journal of Business and Society*, *13*(1), 63-74.

Muhammad, M. A., Sallahuddin, B. H., & Nor, A. B. (2016). Analyzing the impact of external debt on capital formation in Nigeria: An Autoregressive Distributed Lag Approach. *Mediterranean Journal of Social Sciences,* 7(1), 173-183.

Nweke, G. O., Odo, S. I., & Anoke C. I (2017). Effect of capital formation on economic growth in Nigeria. *Asian Journal of Economics, Business and Accounting*, *5*(1), 1-16.

Ogoun, S., & Adumein, W. G. (2020). Towards exchange rate and financial deepening: a dependency determination. *IOSR Journal of Economics and Finance, 11*(1), 42-56.

Ongo, E. N., & Vukenkeng, A. W. (2014). Does gross capital formation matter for economic growth in the CEMAC sub-region? *EuroEconomica, 33*(2), 17-29.

Onwiodiokit, E. A., & Otolorin, G. F. (2021). Capital formation and economic growth in Nigeria: an empirical re-examination. *CBN Bullion*, *45*(2), 58 – 72.

Opudu D. O., & Ogoun, S. (2023). Towards capital formation in Nigeria: role of suspicious transactions reports as an anti-money laundering instrument. Nigerian Journal of Management Sciences, *24*(2a), 284-294.

Opudu, D. O., & Ogoun, S. (2023). Money laundering conviction rate and capital formation in Nigeria. *Growing Science,* Accounting, *9*, 121-130.

Orji, A., & Mba, P. N. (2010). 'Foreign private investment, capital formation and economic growth in Nigeria: a two stage least square approach'. *Journal of Economic and Sustainable Development*, *6*(8), 57-63.

Schumpeter, J. (1934). *Theory of economic development: An inquiry into profits,*

capital, credit, interest, and the business cycle. Cambridge, MA: Harvard University Press,

Schumpeter, J. (2011). *Theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle.* Ukrainian translation by V. Starko. - Kyiv, Publishing House of "Kyiv-Mohyla Academy" (in Ukrainian).

Tobin, J. (1965). Money and economic growth. Econometrica: *Journal of the Econometric Society*, 671-684.

Udofia, M. A., Onwioduokit, E. A., & Effiong, U. E. (2022). The role of capital market on industrial development in Nigeria. *Asian Basic and Applied Research Journal*, *6*(2), 9-18.