The Macro-Level Effects of Disaggregated Private Sector Credit on Gross Fixed Capital Formation in Nigeria.

Timiepere Cornelius Ogaga
Department of Banking and Finance,
Federal University Otuoke, Bayelsa State Nigeria.
timiepereo@gmail.com

Charles Ibebi PhD
Department of Banking and Finance,
Federal University Otuoke, Bayelsa State Nigeria
ibebicharles@gmail.com
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Abstract
This is an empirical research that investigated the macro-level effects of disaggregated private sector credit on gross fixed capital formation (GFCF) in Nigeria. Gross fixed capital formation is the cumulative value of investments in physical assets such as infrastructure, equipment, and machinery, which are crucial for economic growth and development. The data were extracted from the apex Bank of the country's (i.e. Central Bank of Nigeria) statistical bulletins and reports of the National Bureau of Statistics (NBS). This research used annual data for the period 1990-2022. Ordinary least square method (OLS) was employed for estimation of correlation between the dependent variable and the explanatory variables. Augmented dickey fuller to test for stationarity of the time series to avoid spurious regression. The result from the analyses indicated that there is strong evidence to suggest that there is a high correlation between loans and advances to agriculture, forestry and fishery and gross fixed capital formation in Nigeria. Conversely, there is no significant correlation between loans and advances to manufacturing sectors and gross fixed capital formation in Nigeria. Also, Also, there is no significant correlation between the credit provided by commercial banks to small and medium-sized enterprises and the GFCF in Nigeria. The study advises the government to establish policies that enhance access to financial services, including credit, for small-scale farmers, fishers, and forest owners.

KEYWORDS: *Capital Formation, Agriculture, Manufacturing, small and medium scale enterprises.*

1. Background of the study

The impact of credit allocation to the private sector on GFCF is a significant area of interest in macroeconomic research. It is crucial for policymakers, economists, and financial analysts to understand how credit flows to various economic sectors influence investments in fixed capital. Gross fixed capital formation is the cumulative value of investments in physical assets like equipment, infrastructure, and machinery, which are vital for economic growth and development. Examining disaggregated private sector credit data provides insights into how credit is distributed across sectors such as manufacturing, construction, services, and agriculture.

The discussion surrounding the impact of finance on economic development has persisted over time, especially within developing nations. This discourse traces its roots back to the pioneering work of scholars like Schumpeter (1911), who advocated for the idea of finance-driven growth. Financial literature suggests a positive coefficient of correlation between the development of the financial sector and economic growth. This relationship arises from the sector's crucial role in mobilizing and allocating resources. Primarily, resource allocation occurs through the provision and expansion of credit, which facilitates economic activities, stimulates investment, and fosters capital accumulation.

The connection between credit allocation to the private sector and its effect on gross fixed capital formation is a key focus in macroeconomic research (World Bank, 2021). Capital formation acts as an indicator of the level of investment in a country, Capital formation is the needed catalyst to promote production and economic activities in a country (Ojimadu, P., Aniebo, C., & Ogu, C. 2016). Factors such as financial market conditions, banking sector regulations, and monetary policy interventions significantly influence the relationship between private sector credit and fixed capital formation.

Understanding how credit flows to different sectors of the economy influence investment in fixed capital is crucial for policymakers, economists, and financial analysts. Research in this area aims to explore the macroeconomic channels through which credit allocation affects gross fixed capital formation. It investigates how changes in credit availability, interest rates, and credit allocation policies impact investment decisions by businesses and industries (Arellano et al., 2020).

Elements such as financial market conditions, banking sector regulations, and monetary policy interventions are also critical in shaping the relationship between private sector credit and fixed capital formation (Brunnermeier & Schnabel, 2016). Additionally, macroeconomic variables like GDP growth, inflation rates, and exchange rate fluctuations can impact investment behavior and credit demand (Sghaier & Abida, 2020).
Empirical studies typically utilize econometric models and time-series data analysis to examine the dynamics between disaggregated private sector credit and gross fixed capital formation. By identifying causal relationships and transmission mechanisms, researchers aim to provide valuable insights for policymakers to formulate effective strategies to promote investment and economic growth (Kanu, S. I & Ozurumba, B. A., 2014).

In summary, examining the macro-level impacts of disaggregated private sector credit on gross fixed capital formation enhances our understanding of the factors influencing investment activity and the broader dynamics of economic development. The thrust of this paper is therefore to bridge the gap on literature on the macro-level effects of disaggregated private sector credit on gross fixed capital formation in Nigeria.

2.0 Literature Review

The link between disaggregated private sector credit (PSC) and GFCF in Nigeria has increasingly drawn attention from both academic circles and policymakers. This section reviews relevant literature that examines the macro-level effects of private sector credit allocation on GFCF in Nigeria.

Researchers have long acknowledged the critical role of the financial sector in promoting economic growth through efficient resource allocation and facilitating investment, as noted by Beck et al. (2000), financial sector development is positively associated with economic growth, as it enhances access to credit, fosters investment, and stimulates productivity gains. In Nigeria, financial sector reforms in the 2000s aimed at promoting banking sector stability and deepening financial intermediation have contributed to increased credit availability and investment opportunities (Akinola & Owoeye, 2021).

Gross Fixed Capital Formation (GFCF) plays a pivotal role in economic activity and growth across different economies. Several studies have emphasized its significance in promoting economic development by enhancing productivity and fostering long-term growth. For instance, research by Munnell (1990) discusses how investment in fixed capital contributes to productivity improvements, which in turn supports overall economic expansion. Similarly, Aschauer (1989) examines the role of GFCF in driving economic development, particularly in developing countries, by emphasizing the importance of infrastructure investment and capital formation.

The impact of GFCF extends beyond mere economic growth; it also influences sectoral dynamics and economic stability. Studies, such as those by the United Nations (2008) and Bajo-Rubio & Sosvilla-Rivero (1993), have explored how GFCF contributes to sectoral growth, particularly in manufacturing and services, which are heavily reliant on fixed capital investment. Additionally, the stability of an economy can be bolstered by GFCF, as discussed by Kumar (2007), who highlights how investment in fixed capital can mitigate economic fluctuations and promote sustainable development.

Furthermore, the relationship between GFCF and economic performance has been extensively researched to understand its implications for policy formulation and long-term planning. Easterly & Rebelo (1993) and Gollin (2002) delve into the mechanisms through which GFCF enhances productivity growth and supports technological innovation, both of which are essential for economic modernization and industrial upgrading. Moreover, GFCF has been shown to have significant implications for employment levels and macroeconomic stability, as demonstrated in studies by Davis & Haltiwanger (1992) and Barro (1995), respectively.

Gross Fixed Capital Formation serves as a cornerstone of economic development, playing a crucial role in enhancing productivity, driving sectoral growth, and ensuring macroeconomic stability. The literature underscores its importance in promoting long-term economic growth, technological innovation, and employment generation. Policymakers and economists alike recognize the pivotal role of GFCF in fostering sustainable development and mitigating economic vulnerabilities, making it a fundamental aspect of economic planning and policy formulation worldwide

Theoretical Review

Financial Accelerator Theory

The Financial Accelerator Theory is highly pertinent to the study of how disaggregated PSC influences GFCF in Nigeria. According to this theory, fluctuations in credit availability can magnify business cycles by impacting investment decisions and economic activity.

The theory of "Financial Accelerator" was originally proposed and formed by Bernanke, B.S., Gertler, M., and Gilchrist, S. They introduced the theory in a landmark paper published in 1999 titled "The Financial Accelerator in a Quantitative Business Cycle Framework".

The Financial Accelerator Theory, offers a comprehensive framework for understanding how fluctuations in credit availability amplify economic fluctuations. Grounded in the notion of financial market imperfections, the theory highlights that credit constraints, collateral requirements, and other frictions can significantly influence economic outcomes. During economic downturns, tighter credit conditions exacerbate the contraction as firms and households cut back on spending and investment. This negative feedback loop can deepen the downturn. Conversely, during economic expansions, easier credit conditions stimulate spending and investment, amplifying the upturn. Changes in credit availability directly affect firms' investment decisions, particularly in fixed capital, thereby influencing Gross Fixed Capital Formation (GFCF).

Empirical evidence supports the theory's predictions, showing that fluctuations in credit availability amplify business cycle fluctuations. Studies indicate that sectors dependent on external finance are especially sensitive to changes in credit conditions. The Financial Accelerator Theory has important implications for monetary and fiscal policy. Central banks may adjust interest rates to influence credit conditions and mitigate economic fluctuations. Policies that reduce financial frictions and improve credit market efficiency can stabilize credit cycles and economic activity. Overall, the theory continues to be relevant for policymakers and researchers studying economic dynamics and financial stability, emphasizing the critical role of credit in the macroeconomy.

Empirical Review

Torbira, L.L,. & Ogbulu, O.M., (2014): Torbira and Ogbulu find that credit allocation to the private sector significantly influences investment decisions, particularly in sectors such as manufacturing, construction, and services. Access to credit enables businesses to finance capital expenditures, acquire machinery and equipment, and undertake infrastructure projects, thereby contributing to GFCF.

Nwachukwu and Asogwa (2015): Nwachukwu and Asogwa investigated on the effect of credit on investment in Nigeria using Vector Autoregressive (VAR) models. They found that an increase in private sector credit positively impacts investment, including GFCF, in the manufacturing and agricultural sectors.

Ugwuegbe, S. U., & Uruakpa, P., C. (2013): Ugwuegbe and Uruakpa observed that credit allocation to productive sectors such as manufacturing and construction is positively associated with GFCF. These sectors require substantial investment in fixed capital to expand production capacity and enhance competitiveness. Conversely, credit allocation to non-productive sectors such as real estate speculation may not significantly contribute to GFCF and may even pose risks to financial stability.

Ogunbiyi & Adeyemi (2019): Ogunbiyi and Adeyemi examined the effectivity of monetary policy in influencing credit allocation and Gross Fixed Capital Formation (GFCF) in Nigeria. They discovered that changes in interest rates and reserve requirements impact the cost and availability of credit, thereby influencing investment decisions and GFCF. However, the transmission

mechanism of monetary policy to credit allocation and investment outcomes can vary based on factors such as financial market development, banking sector efficiency, and the structure of the economy.

Lawal Adedoyin Isola, Muritala Taiwo, Akinola Taiwo (2017): Isola et al. researched the link between bank credit and economic advancement in Nigeria. Employing time-series data and econometric techniques like Vector Error Correction Model (VECM), they identified a high positive effect of bank credit on economic advancement. Increased credit allocation to the private sector stimulates investment in fixed capital, thereby contributing to overall economic development.

Gabriel Ifeanyi Okafor (2018): Okafor explored the relationship between credit market development and economic growth in Nigeria using panel data analysis techniques. They discovered a positive and high correlation between credit market development and GFCF. This finding suggests that enhancements in credit market efficiency encourage investment in fixed capital and contribute to economic growth.

Olusegun Akanbi, Afees Salisu, Olumuyiwa Tolulope Apanisile (2019): Akanbi et al. assessed the connection between financial development, investment, and economic growth in Nigeria, employing time-series data analysis and ARDL modeling. They found out that financial development, characterized by increased private sector credit allocation, positively influences investment in fixed capital, leading to enhanced economic growth.

Mordi Chukwudi, Igberaese Jeremiah (2016): Chukwudi and Jeremiah assessed the correlation between foreign direct investment (FDI), financial deepening, and economic growth in Nigeria. Their research revealed a significant positive relationship between financial deepening and Gross Fixed Capital Formation (GFCF). This underscores the importance of a well-developed financial sector in facilitating investment and fostering economic growth.

Ezeabasili, V. C., & Adigwe, P. K. (2017): Ezeabasili and Adigwe investigated the relationship between financial deepening and economic growth in Nigeria. Employing econometric techniques like; the Vector Error Correction Model (VECM) & Johansen cointegration test, they identified a positive and significant impact of financial deepening on Gross Fixed Capital Formation (GFCF). This suggests that increased credit allocation to the private sector stimulates investment in fixed capital, thereby contributing to economic growth.

Johnson, A. I., & Azeez, A. G. (2019): Johnson and Azeez determined the connection between bank credit and economic growth in Nigeria applying an auto-regressive distributed lag (ARDL) concept. Their study revealed a significant positive correlation between bank credit and Gross Fixed Capital Formation (GFCF). This indicates that increased credit allocation to the private sector stimulates investment in fixed capital, thereby fostering economic growth.

Sheu Suleiman, Owoye Oluwatosin (2019): Suleiman and Oluwatosin explored the effect of bank credit on industrial outcome in Nigeria. Time-series data and econometric techniques such as Granger causality tests and vector autoregression (VAR) models were employed Their findings indicated a significant positive impact of bank credit on industrial output, highlighting the role of

credit allocation in promoting industrial growth and Gross Fixed Capital Formation (GFCF) in Nigeria.

3.0 RESEARCH METHODOLOGY

The research design applied aligns with the Ex-post facto design type paradigm. Data collection utilized secondary sources, specifically obtained from the apex Bank's (i.e. Central Bank of Nigeria) Statistical Bulletin. Ordinary Least Squares (OLS) method was used to determine the relationships between the dependent variable and the explanatory variables. The Augmented Dickey-Fuller test was applied to assess the stationarity of the time series data to prevent spurious regression.

To determine the existence of a long-run equilibrium correlation among the variables, cointegration tests were conducted. Additionally, an Error Correction Model (ECM) was estimated to capture short-run relationships between the variables. These procedures were essential in ensuring a robust analysis and interpretation of the empirical results.

Model Specification

This research adopted a model based on Ojimadu, P., Aniebo, C., & Ogu, C. (2016), to assess empirically, the effect of domestic savings on the economic growth of Nigeria within the period under review, with the following specification:

The explained variable (dependent variable) is Gross Fixed Capital Formation (GFCF).

The explanatory variables (independent variables) include:

Loans and advances to Agriculture, forestry, and Fishery
Loans and advances to Manufacturing Sector
Commercial banks credit to small and medium scale enterprises

This model will be used to assess how these variables influence economic growth, particularly through their impact on Gross Fixed Capital Formation (GFCF). The functional model is specified as follows:

$$GCF = (LAFF, LOM, CSME)\ \beta_1 \quad 3.3$$

$$GCF = a_0 + \beta_1 LAFF + \beta_2 LOM + \beta_3 CSME + \mu_t \quad 3.4$$

A' priori Economic Expectation: $a_{1-3} > O$

Where:

LAFF	= Loans and advances to Agriculture, forestry and Fishery
GCF	= Gross Domestic Fixed Capital Formation
LOM	= Loans and advances to Manufacturing Sectors
CSME	= Commercial banks credit to small and medium scale enterprises.
a_0	= Intercept Terms
$\beta_1 - \beta_3$	= coefficients

A-prior Expectation of the Result

The explanatory variables are expected to have positive and direct effects on the dependent variables. That is a unit rise in any of the variables that is expected to cause a rise in Gross Domestic Product. This can be expressed mathematically as $\beta_1, \beta_2, \beta_3 > 0$.

DATA PRESENTATION AND ANALYSIS

Table 1 Descriptive Statistic Result

	GCF	LAFF	LOM	CSME
Mean	47.60579	167.1829	760.8630	35172.17
Median	865.7600	62.10280	352.0383	32374.50
Maximum	16908.13	556.6700	3505.550	90176.50
Minimum	70.81000	6.978900	15.40390	10747.89
Std. Dev.	5987.738	185.4761	869.6160	22770.17
Skewness	0.860402	1.047422	1.496724	0.918335
Kurtosis	2.015340	2.509840	4.878321	3.018460
Jarque-Bera	4.422059	5.207210	14.04992	3.795414
Probability	0.109588	0.074006	0.000889	0.149912
Sum	127683.8	4513.939	20543.30	949648.6
Sum Sq. Dev.	9.32E+08	894436.3	19662033	1.35E+10
Observations	32	32	32	32

Source: Extract from E-view 10.0

The table provides descriptive statistics for the variables in the analysis. The skewness statistic indicates that all variables are positively skewed since their values are greater than zero. The Jarque-Bera statistic is greater than the 5% level of significance, leading us to accept the null hypothesis, indicating that the series are normally distributed. Additionally, the table shows the sum of all variables and the sum of the squared deviations.

4.2 Hypotheses Testing

To test the hypotheses, probability criteria was used. if:

$p > 0.05$: Accept HO.

$p < 0.05$: Reject HO

Table 4.2: Extracting for testing hypothesis one

Variable	Co-efficient	t-Statistics	Prob.*	Decision
LAFF	27.15547	5.992748	0.0000	Reject

Source: Researcher

Based on the low p-value (less than 0.05), we reject the null hypothesis that the coefficient for LAFF is zero. This suggests that the variable LAFF has a statistically significant impact on the dependent variable, which is gross fixed capital formation in the regression model.

Table 4.3: Extracting for testing hypothesis two

Variable	Co-efficient	t-Statistics	Prob.*	Decision
LOM	0.812995	0.846380	0.4061	Accept

Source: Researcher

The coefficient value for LOM is 0.812995. This coefficient indicates the estimated effect of a one-unit change in loans and advances to the manufacturing sectors on gross fixed capital

formation, while holding other variables constant. Specifically, it suggests that for every one-unit increase in loans and advances to the manufacturing sectors, the dependent variable is estimated to rise by 0.812995 units.

The t-statistic connected with the coefficient estimate for LOM is 0.846380. The t-statistic measures the significance of the coefficient estimate. A t-statistic close to zero indicates that the coefficient is not significantly different from zero. In this case, the t-statistic of 0.846380 suggests that the coefficient for LOM is not statistically significant.

The p-value associated with the coefficient estimate for LOM is 0.4061. The p-value of 0.4061 is higher than 0.05, indicating that the coefficient estimate for LOM is not statistically significant. Therefore, we accept the null hypothesis that there is no significant correlation between loans and advances to the manufacturing sectors and GFCF in Nigeria.

Table 4.4: Extracting for testing hypothesis three

Variable	Co-efficient	t-Statistics	Prob.*	Decision
CSME	-0.022208	-1.743091	0.0947	Accept

Source: Researcher

The coefficient value for CSME is -0.022208. This coefficient represents the estimated effect of a one-unit change in commercial banks credit to small and medium scale enterprises on the dependent variable, which is gross fixed capital formation (GFCF), while holding other variables constant. Specifically, it suggests that for every one-unit increase in commercial banks credit to small and medium scale enterprises (SMSE) , the gross fixed capital formation is estimated to decrease by 0.022208 units.

The t-statistic associated with the coefficient estimate for CSME is -1.743091. The t-statistic measures the significance of the coefficient estimate. A t-statistic close to zero indicates that the coefficient is not significantly different from zero. In this case, the t-statistic of -1.743091 suggests that the coefficient for CSME is not statistically significant at conventional levels of significance.

The p-value associated with the coefficient estimate for CSME is 0.0947. The p-value of 0.0947 is higher than 0.05, indicating that the coefficient estimate for CSME is not statistically significant. Therefore, we accept the null hypothesis that there is no significant relationship between commercial banks credit to SMSE and gross fixed capital formation in Nigeria.

4.5 Discussion of Results

This study employed regression analysis to examine the effects of The Macro-Level Effects of Disaggregated Private Sector Credit on Gross Fixed Capital Formation in Nigeria. The rest of this section discusses the findings of the study.

Effect of Loans and advances to agriculture, forestry and fishery and gross fixed capital formation

The coefficient estimate for LAFF is statistically significant, as indicated by the relatively low p-value (0.0000) and the high t-statistic (5.992748). This suggests a strong and robust relationship between loans and advances to agriculture, forestry, and fishery and GFCF.

The coefficient value (27.15547) indicates the estimated change in GFCF associated with a one-unit increase in loans and advances to agriculture, forestry, and fishery, holding other variables constant. This magnitude suggests that changes in loans and advances to these sectors have a

substantial impact on GFCF, with an average increase of approximately 27.15547 units in GFCF for every unit increase in loans and advances.

With a positive coefficient for LAFF, the interpretation indicates that an increase in loans and advances to agriculture, forestry, and fishery is associated with a corresponding increase in Gross Fixed Capital Formation. This implies that greater financial support to these sectors stimulates investment in fixed assets within the economy.

Effect of Loans and advances to Manufacturing Sectors and gross fixed capital formation

The coefficient estimate for LOM indicates a p-value of 0.4061, which is greater than conventional levels of significance such as 0.05. Additionally, the t-statistic is 0.846380, suggesting that the coefficient for LOM is not statistically significant at the typical levels. This implies that the relationship between loans and advances to manufacturing sectors and Gross Fixed Capital Formation may not be robust.

The coefficient value (0.812995) signifies the estimated change in Gross Fixed Capital Formation associated with a one-unit increase in loans and advances to manufacturing sectors, holding other variables constant. However, given the lack of statistical significance, it's essential to interpret this coefficient cautiously.

With a positive coefficient for LOM, the interpretation suggests that an increase in loans and advances to manufacturing sectors may lead to a corresponding increase in Gross Fixed Capital Formation. However, without statistical significance, we cannot confidently conclude the presence of such a relationship based solely on the coefficient estimate.

While the findings do not demonstrate statistical significance, they still provide insights for policymakers. It highlights the potential importance of loans and advances to manufacturing sectors in influencing Gross Fixed Capital Formation. Policymakers may consider further investigation or targeted interventions to better understand and potentially stimulate investment in manufacturing.

Effect of Commercial banks credit to small and medium scale enterprises and gross fixed capital formation

The coefficient estimate for CSME is not statistically significant, as indicated by the relatively high p-value (0.0947) and the t-statistic (-1.743091) falling below conventional thresholds. This suggests that the relationship between commercial banks credit to small and medium scale enterprises (SMSE) and GFCF may not be robust or meaningful in the given context.

The coefficient value (-0.022208) indicates the estimated change in GFCF associated with a one-unit increase in commercial banks credit to SMSE, holding other variables constant. However, since this coefficient is not statistically significant, it should be interpreted with caution. It implies a small negative effect on GFCF, but this effect is not deemed reliable based on the statistical analysis.

The negative coefficient suggests that an increase in commercial banks' credit to SMSE is associated with a slight decrease in GFCF. However, due to the lack of statistical significance, this interpretation may not be reliable, and the relationship should be further investigated. This study aligns with Paschal Ojimadu, Chibueze Aniebo, and Callistus Ogu (2016)

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Findings of this research underscore the importance of The Macro-Level Effects of Disaggregated Private Sector Credit on Gross Fixed Capital Formation in Nigeria.

Loans and Advances to Agriculture, Forestry, and Fishery (LAFF): The study highlights a strong positive relationship between loans and advances to these sectors and GFCF. This suggests that increased financial support to agriculture, forestry, and fishery stimulates investment in fixed assets, indicating the importance of targeted financial interventions in fostering economic growth.

Loans and Advances to Manufacturing Sectors (LOM): Conversely, the analysis does not find a statistically significant relationship between loans and advances to manufacturing sectors and GFCF. This suggests that financial support to manufacturing, while essential for sectoral growth, may not directly translate into increased investment in fixed assets, warranting further investigation into other factors influencing investment decisions in the manufacturing sector.

Commercial Banks Credit to Small and Medium Scale Enterprises (CSME): The study finds a non-significant relationship between commercial banks credit to small and medium scale enterprises and GFCF. This indicates that policies solely focused on increasing credit availability to these enterprises may not directly impact investment in fixed assets in the manufacturing sector, emphasizing the need for comprehensive strategies to stimulate capital formation.

Recommendations

1. Implement policies aimed at improving access to financial services, including credit, for small-scale farmers, fishers, and forest owners.
2. Support initiatives that promote technological innovation and adoption within the manufacturing sector, including research and development grants, tax incentives for investment in advanced manufacturing technologies, and industry-academic collaborations.
3. Encourage collaboration between commercial banks, government agencies, industry associations, and non-profit organizations to provide comprehensive support services to SMEs, including training programs on financial management, marketing strategies, and technology adoption

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