Impact of financial inclusion, financial stability, bank nonperforming loans, inflation, macroeconomic management quality and unemployment on economic growth in Nigeria

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Abstract

The study investigates the impact of financial inclusion, financial stability, bank nonperforming loans, inflation, macroeconomic management quality and the unemployment rate on economic growth in Nigeria. The data are analyzed using the ordinary least squares regression, generalized linear model regression, robust least squares regression, and the quantile regression methods. The sample period is from 2007 to 2022. The findings reveal that financial inclusion, inflation rate and macroeconomic management quality are significant determinants of economic growth in Nigeria. Bank nonperforming loans, unemployment rate, international trade and climate change have an insignificant effect on economic growth in Nigeria. Also, financial inclusion, inflation rate, financial stability, macroeconomic management quality and the unemployment rate are significant determinants of economic growth in good economic years in Nigeria. The implication of the findings is that the well-known catalysts of economic growth, such as financial inclusion and financial stability, are not positive catalysts of economic growth in Nigeria during good economic years. Therefore, it is recommended that policymakers should find the right level of financial inclusion, financial stability and unemployment that stimulate economic growth in Nigeria.

Keywords: Nigeria, financial inclusion, financial stability, nonperforming loans, bank, inflation, macroeconomic management quality, unemployment rate, economic growth, international trade, climate change.

1. Introduction

The economic growth literature identifies many economic factors that affect economic growth in developed countries. The most notable of them are institutional quality, unemployment, and inflation, among others (Malanski and Póvoa, 2021; Ren et al, 2022). Recent socioeconomic and financial developments which have occurred, and those which are still occurring, have led many scholars to interrogate the traditional determinants of economic growth, and shift their focus to other factors that affect economic growth particularly the socioeconomic factors, the macro-financial factors and the developmental factors affecting economic growth. These factors exert some impact on economic growth in developing countries because developing countries have imperfect markets, weak institutions and other structural problems that require direct socioeconomic and other development interventions to stimulate economic growth (Upreti, 2015; Ozili et al, 2023a).

Nigeria is a peculiar developing country that has poor economic management, imperfect markets and high information asymmetry coupled with weak institutions and a low level of financial inclusion which hinders financial sector development and human capital development, thereby leading to rising poverty. These issues together with the frequent macroeconomic instability in Nigeria, which is characterized by high inflation and high unemployment, makes it difficult to determine the main drivers of economic growth in Nigeria. Therefore, it is important to assess whether the factors which are peculiar to Nigeria particularly the level of financial inclusion, financial stability, bank nonperforming loans, inflation, macroeconomic management quality and unemployment have a significant impact on economic growth considering the fact that many of these factors are not the traditional determinants of economic growth in the economic growth literature. It is therefore interesting to ascertain whether these factors which are peculiar to Nigeria are significant determinants of economic growth in Nigeria. Few studies in the literature have examined the factors affecting economic growth in Nigeria (Chimobi, 2010; Ajide, 2014; Ozili et al, 2023a), but these studies have not considered financial inclusion, financial stability, bank nonperforming loans, macroeconomic management quality, climate change, international trade and unemployment as potential factors affecting economic growth in Nigeria.

In the empirical analysis, this study empirically investigates the effect of financial inclusion, financial stability, bank nonperforming loans, inflation, macroeconomic management quality, climate change, international trade, and unemployment on economic growth in Nigeria. Several estimation methods are used to estimate the determinants of economic growth in Nigeria. The findings show that the level of financial inclusion, inflation rate and macroeconomic management quality are significant determinants of economic growth in Nigeria while bank nonperforming loans, unemployment rate, international trade and climate change have an insignificant effect on economic growth in Nigeria. The findings also reveal that the level of financial inclusion, inflation rate, financial stability, macroeconomic management quality and the unemployment rate are significant determinants of economic growth in good economic years in Nigeria.

The study contributes to the economic growth literature that examines the factors influencing economic growth in several country contexts. This study adds to the economic growth literature by focusing on Nigeria. It aims to determine the traditional and non-traditional factors affecting economic growth in Nigeria. The study also contributes to the African economic literature that examines the factors affecting economic growth and development in the African region. This study identifies some factors that affect economic growth in African countries with particular focus on Nigeria.

The remaining sections of this article are organized as follows. Section 2 provides the review of the existing economic growth literature. Section 3 presents the research design used for the study. Section 4 presents the empirical results. Section 5 presents the conclusion of the study.

2. Literature review

The finance and growth theory, postulated in Levine (2005), argues that finance plays an important role in the process of economic growth by decreasing the cost of capital to firms, allocating capital efficiently among entrepreneurs, and promoting greater competition among firms (Levine, 2005). Meanwhile, the institutional theory of economic growth argues that institutions matter for economic growth because good institutions provide an incentive

structure that enable economic agents to engage in economic activities and contribute to economic growth in a manner that reduces uncertainty, promotes efficiency, and protect property rights (Acemoglu and Robinson, 2008).

Existing studies investigate several factors affecting growth in developing countries. For instance, Verma et al (2023) examined some determinants of economic growth in developing countries from 2005 to 2019. They used the dynamic ordinary least squares regression method. They found that information and communication technology (ICT) diffusion, financial development, and trade openness lead to higher economic growth while high inflation hinders economic growth. Azam and Feng (2022) considered the role of foreign aid in stimulating economic growth in 37 developing countries. The authors used the fixed-effect regression method and the robust least squares estimator to analyse the data. They found that foreign aid has a positive effect on economic growth in developing countries. However, foreign aid has a limited impact on economic growth in low-income countries where exports play a significant role in contributing to economic growth. Urbano et al (2020) examined the effect of institutions on economic growth in 14 developing countries from 2004 to 2012. They found a causality running from institutions to economic growth in developing countries. Dao (2012) examined the effect of population on economic growth in forty-three developing economies using data obtained from the 2010 World Development Indicators. The author used the ordinary least-squares estimation method to analyse the data and found that population growth has a significant effect on economic growth in the developing countries examined. Upreti (2015) assessed a number of factors affecting economic growth in some developing countries. The author analysed 76 countries from 1995, 2000, 2005 and 2010. The results showed that higher exports, abundant natural resources, higher life expectancy, and higher investment rates lead to higher economic growth in the selected developing countries. Zahonogo (2016) focused on trade openness as a determinant of economic growth. The author examined whether trade openness has a significant influence on economic growth in developing countries, focusing on 42 sub-Saharan African countries from 1980 to 2012. The author used a dynamic growth model and found that a trade threshold exists. This means that higher trade openness increases economic growth up to a threshold after which higher trade openness leads to a decrease in economic growth.

Financial inclusion and financial stability have also been identified as determinants of economic growth in the existing literature. Regarding financial inclusion, Van et al (2021) examined the impact of financial inclusion on economic growth in a multi-country context. They found a positive relationship between financial inclusion and economic growth in low-income countries. Erlando et al (2020) also analyzed the impact of financial inclusion on economic growth in Eastern Indonesia. They found a causality between financial inclusion and economic growth. They also found that financial inclusion has a positive effect on inequality in Eastern Indonesia. Ahmad et al (2021) assessed the effect of digital financial inclusion on economic growth in provinces in China. They found that digital financial inclusion has a significant effect on provincial economic growth in China. Emara et al (2021) also examined the relationship between financial inclusion and economic growth in 44 emerging markets and Middle East and North Africa (MENA) countries from 1990 to 2018. They found that financial inclusion has a positive effect on GDP per capita growth in emerging markets and MENA countries.

Regarding financial stability, Ijaz et al (2020) examined the impact of bank competition and financial stability on economic growth in 38 European countries from 2001 to 2017. Bank stability was measured using the Z-score. They found that bank stability improves economic growth in European countries. Stewart et al (2021) examined the relationship between bank stability and economic growth in more than 100 countries from 1995 to 2015. They measured bank stability using regulatory capital. They found a positive relationship between bank stability and economic growth. Alsamara et al (2019) explored the relationship between financial stability and economic growth in Qatar from 1980:Q1 to 2013:Q4 using the vector error correction model. They found that real GDP growth has a long-run negative impact and a moderate short-run positive impact on financial stability in Qatar. Younsi and Nafla (2019) examined the relationship between financial stability, monetary policy, and economic growth in 40 countries from 1993 to 2015 using panel regression models. They found that trade openness, capital account openness, and foreign direct investment are determinants of economic growth.

Other studies focused on the factors affecting economic growth in Nigeria. For instance, Adelakun (2011) examined the effect of human capital development on economic growth in Nigeria. Using the ordinary least square regression estimation method, the author found

evidence of a significant positive relationship between human capital development and economic growth in Nigeria. Based on their findings, the author recommended that policymakers should work towards developing human capital to stimulate economic growth in Nigeria. Onyeiwu (2012) also used the ordinary least squares method to examine the effect of monetary policy on economic growth in Nigeria using data which span from 1981 to 2008. The results showed that monetary policy which was measured by money supply has a significant positive effect on GDP growth in Nigeria. Nyoni and Bonga (2018) examined some determinants of economic growth in Nigeria and found that inflation, population growth, interest rate, foreign direct investment, export, public investment, and private investment are determinants of economic growth in Nigeria. Ajide (2014) assessed the role of economic freedom on the relationship between foreign direct investment and economic growth during the 1980 to 2010 period. The study used the Frazer economic freedom index to measure economic freedom, and found that labour, life expectancy, trade openness and economic freedom are determinants of economic growth in Nigeria.

Chimobi (2010) examined the link between inflation and economic growth in Nigeria using cointegration and granger causality tests. The author analysed data from 1970 to 2005 and found a unidirectional causality running from inflation to economic growth in Nigeria. Akeju and Olanipekun (2014) attempted to verify the theoretical proposition of the Okun's law which posits a negative relationship between unemployment rate and economic growth. In their study, Akeju and Olanipekun (2014) examined the relationship between unemployment rate and economic growth and found a short run and long run relationship between unemployment and economic growth. Adeniyi et al (2015) focused on the finance–growth nexus and examined the relationship between financial development and economic growth in Nigeria from 1960 to 2010. They found that financial development has a negative impact on economic growth up to a threshold after which the effect of financial development on economic growth is positive in Nigeria. Udeh et al (2016) examined the effect of external debt on economic growth in Nigeria using data from 1980 to 2013. The author used the ordinary least square regression method and found that external debt has a positive effect on economic growth in the short run and has a negative effect on economic growth in the long run. Sulaiman and Azeez (2012) also examined the impact of external debt on economic growth in Nigeria using data from 1970 to 2010. The authors used the ordinary least square

regression method to estimate the data and found that external debt has a positive impact on the Nigerian economy. While the above studies examined some determinants of economic growth in Nigeria, they did not examine some important non-traditional determinants of economic growth in Nigeria such as financial inclusion, financial stability, nonperforming loans, and macroeconomic management quality. The present study extends the literature by focusing on the effect of financial inclusion, nonperforming loans, financial stability, macroeconomic management quality, inflation, international trade, climate change and unemployment on economic growth in Nigeria.

3. Research design

Nigeria annual data were collected from the World development indicators and the global financial development indicators database of the World Bank (see table 1). The sample period is from 2007 to 2022. The descriptive statistics in table 2 shows that the average economic growth variable (GDPR) is 3.94%, the average inflation rate (INF) is 1.29%, the average unemployment rate (UNEMP) is 10.39%, the average macroeconomic management quality index (MAC) is 3.59%, the average nonperforming loans ratio (NPL) is 9.69%, the average bank capital to assets ratio (FSB) is 9.28%, the average climate change indicator is 0.10%, the average merchandise trade ratio is 27.91%, and the average financial inclusion level (FIC) is 616.96.

The model used to estimate the determinants of economic growth in Nigeria is a multivariate econometric model as shown below. The variables included in the model are listed in equation 1.

$$GDPRt = FICt + FSBt + INFt + MACt + NPLt + UNEMPt + et \ldots\ldots eqn\,1$$

Where t = year, GDPR = GDP growth (annual %), FIC= bank accounts per 1,000 adults which measures the level of financial inclusion, FSB = bank capital to assets ratio (%) which measures financial stability, NPL = bank nonperforming loans to total gross loans (%), MAC = CPIA macroeconomic management quality index, UNEMP = total unemployment rate, INF = inflation rate, e = error term.

The variables included in the model are justified as follows. The GDPR variable represents the real gross domestic product growth rate. The GDPR variable is the dependent variable in the model. The FIC variable represents the level of financial inclusion. Several studies such as Kim et al (2018) and Ozili et al (2023b) show that greater financial inclusion leads to an increase in bank deposits from banked adults. The increase in bank deposits will increase banks' ability to lend to borrowers from deposits and it increases the overall level of financial intermediation which contributes to positive economic growth. Therefore, financial inclusion is expected to have a positive effect on economic growth in Nigeria.

The FSB variable represents the level of financial stability. Several studies such as Creel et al (2015) and Ozili (2024) show that greater financial stability via high capital adequacy ratio ensures that banks have sufficient capital to absorb any shock that may arise from banks' risky lending to sectors that contribute to economic growth. As banks become more stable, they will be able to support productive economic activities that enhance economic growth. Therefore, financial stability is expected to have a positive effect on economic growth in Nigeria.

The NPL variable represents the level of nonperforming loans in the banking sector. Tölö and Virén (2021) show that high nonperforming loans would give rise to high bank provisions, deplete banks' interest income, decrease banks' overall profitability and limit banks' ability to give out more loans to the sectors that drive growth in the economy. This indicates that high nonperforming loans have the potential to hinder economic growth. Therefore, nonperforming loans is expected to have a negative effect on economic growth in Nigeria.

The MAC variable represents the quality of macroeconomic management. It is expected that greater macroeconomic management quality will give rise to low economic policy uncertainty. It will create an enabling policy environment that allows businesses to thrive and grow. This will stimulate economic activities and lead to higher economic growth. Therefore, macroeconomic management quality is expected to have a positive effect on economic growth in Nigeria.

The INF variable represents the rate of inflation. Gokal and Hanif (2004) show that a high rate of inflation decreases the purchasing power of consumers and increases the cost of production for businesses which will compel businesses to decrease output, thereby leading

to lower economic growth. Therefore, inflation is expected to have a negative effect of economic growth in Nigeria.

The UNEMP variable represents the rate of total unemployment. Darma and Onimisi (2017) show that a high rate of unemployment means that few workers are available to work. This would lead to low economic output and decreased economic growth. Therefore, the unemployment rate is expected to have a negative effect on economic growth in Nigeria.

Regarding the estimation methods adopted in this study, the study used the ordinary least squares (OLS) regression method to estimate the impact of financial inclusion, inflation rate, financial stability, nonperforming loans, macroeconomic management quality and the unemployment rate on economic growth. The study also estimates the model using alternative estimation methods to ensure that the regression results are robust. The additional estimation techniques used are the generalized linear model regression method, the robust least squares regression method, and the quantile regression method.

Table 1. The variables description and sources

Symbol	Variable	Indicator	Source
FIC	Bank accounts per 1,000 adults (i.e., number of depositors)	Level of financial inclusion	Global Financial Development indicators, World Bank
FSB	Bank capital to total assets ratio (%)	Financial stability	Global Financial Development indicators, World Bank
NPL	Bank nonperforming loans to total gross loans (%)	Bank asset quality	Global Financial Development indicators, World Bank
MAC	CPIA macroeconomic management quality index	Quality of macroeconomic management	World Development Indicators, World Bank
GDPR	Real GDP growth (annual %)	Economic growth rate	World Development Indicators, World Bank
INF	Inflation, consumer prices (annual %)	Inflation rate	IMF International Financial Statistics
UNEMP	Total unemployment rate	Total unemployment	International Labour Organisation
MTG	Merchandise trade (% of GDP)	International trade	World Development Indicators, World Bank
CCL	CO2 emissions from solid fuel consumption (% of total)	Climate change	World Development Indicators, World Bank

Source: Table courtesy of the World Bank's World Development Indicators

Table 2. Descriptive statistics									
	GDPR	FIC	FSBB	INF	MAC	NPL	UNEMP	MTG	CCL
Mean	3.937	616.962	9.281	12.286	3.593	9.693	10.394	27.911	0.104
Median	3.938	647.565	9.587	12.159	3.750	6.029	9.872	27.112	0.108
Maximum	8.036	1310.392	17.954	18.847	4.500	37.253	12.588	41.491	0.127
Minimum	-1.794	6.816	1.490	5.388	2.500	2.963	6.816	16.514	0.069
Std. Dev.	3.122	367.958	4.127	3.572	0.663	8.779	1.489	8.014	0.018
Skewness	-0.434	0.062	0.254	0.006	0.001	2.126	-0.311	0.223	-0.675
Kurtosis	2.182	2.440	2.968	2.487	1.588	7.148	3.365	1.883	2.471
Jarque-Bera	0.949	0.219	0.173	0.175	1.328	23.531	0.347	0.963	0.876
Probability	0.621	0.896	0.917	0.916	0.514	0.000	0.840	0.617	0.645
Observations	16	16	16	16	16	16	16	16	10

Source: Author's own work

4. Empirical Results

4.1. Correlation analysis

The full sample correlation result, reported in table 3, shows that the MAC, NPL and MTG variables are positively correlated with the GDPR variable. This indicates that increase in macroeconomic management quality, bank nonperforming loans and merchandise trade are positively correlated with economic growth in Nigeria. However, only the MAC and MTG variables are positive and significantly correlated with the GDPR variable in table 3. This indicates that a positive improvement in Nigeria's macroeconomic management quality and merchandise trade is significantly correlated with higher economic growth. In contrast, the FIC, FSB, INF, UNEMP and CCL variables are negatively correlated with the GDPR variable. This indicates that increase in financial inclusion, financial stability, inflation rate, unemployment rate and climate change risk are negatively correlated with economic growth in Nigeria. However, only the FIC and UNEMP variables are negative and significantly correlated with the GDPR variable in table 3. This indicates that an increase in Nigeria's financial inclusion level and unemployment rate are significantly correlated with lower economic growth.

Table 3. Pearson correlation for the variables

Variables	GDPR	FIC	FSBB	INF	MAC	NPL	UNEMP	MTG	CCL
GDPR	1.000								

FIC	-0.708**	1.000							
	(0.02)	-----							
FSB	-0.282	-0.191	1.000						
	(0.42)	(0.59)	-----						
INF	-0.369	0.330	-0.438	1.000					
	(0.29)	(0.35)	(0.21)	-----					
MAC	0.714**	-0.245	-0.085	-0.449	1.000				
	(0.02)	(0.49)	(0.81)	(0.19)	-----				
NPL	0.289	-0.246	-0.642**	0.430	-0.224	1.000			
	(0.41)	(0.49)	(0.04)	(0.21)	(0.53)	-----			
UNEMP	-0.923***	0.736**	0.178	0.324	-0.748**	-0.162	1.000		
	(0.00)	(0.01)	(0.62)	(0.36)	(0.01)	(0.65)	-----		
MTG	0.673**	-0.771**	0.087	-0.164	0.554*	-0.014	-0.858***	1.000	
	(0.03)	(0.01)	(0.81)	(0.64)	(0.09)	(0.96)	(0.00)	-----	
CCL	-0.184	0.584*	-0.558*	0.568*	-0.005	0.318	0.239	-0.462	1.000
	(0.61)	(0.07)	(0.09)	(0.08)	(0.98)	(0.36)	(0.51)	(0.17)	-----

***, **, * represent statistical significance at the 1%, 5% and 10% level. P-values are in parenthesis.

Source: Author's own work

4.2. Determinants of economic growth in Nigeria: full sample analysis

Table 4 reports the regression results for the full sample analysis. The dependent variable is real GDP growth (GDPR). The results are estimated using the ordinary least squares (OLS) regression method, the generalized linear model regression (GLM) method, the robust least squares (RLS) regression method, and the quantile regression method. The dependent variables are the FIC, FSB, INF, MAC, NPL and UNEMP variables. The FIC coefficient is negative and significantly related to real GDP growth rate in the OLS, GLM and RLS estimations in columns 1, 2 and 3. This indicates that a high level of financial inclusion, through greater number of bank depositors, leads to a decrease in economic growth in Nigeria. The observed negative relationship between financial inclusion and economic growth in Nigeria contradicts the findings of Kim et al (2018) and Ozili et al (2023c) who document a positive effect of financial inclusion on economic growth in their cross-country studies. The explanation for the observed negative effect of financial inclusion on economic growth in Nigeria is that bank-based measures of financial inclusion, i.e., the number of depositors or people with bank

accounts, do not increase economic growth in Nigeria. Intuitively, simply putting money in bank accounts do not necessarily translate to higher economic growth until the deposits are channeled to consumption, production and investment activities that lead to positive economic growth. If bank deposits remain in bank accounts and are un-utilised for lending, it won't contribute to economic growth. This explains the observed negative relationship between the bank-based financial inclusion indicator and economic growth in Nigeria. Furthermore, non-bank indicators of financial inclusion such as fintech, mobile money and digital apps are doing a lot more than banks to accelerate financial inclusion and stimulate economic growth (Liu et al, 2021). Therefore, it is possible that the bank-based measures of financial inclusion do not seem to improve economic growth because the fintech-based measures of financial inclusion are stimulating economic growth in Nigeria.

The FSB coefficient is negative and significantly related to real GDP growth rate in the GLM estimation in column 2. This indicates that greater financial stability, via higher capital adequacy ratio, does not lead to a significant increase in economic growth in Nigeria. The observed negative relationship between financial stability and economic growth in Nigeria contradicts the findings of Creel et al (2015) and Ozili (2024) who document a positive effect of financial stability on economic growth. The explanation for the observed negative effect of financial stability on economic growth in Nigeria lies in how financial stability is measured. In this study, financial stability is measured using the capital adequacy ratio. Generally, banks that have a high capital adequacy ratio (i.e., capital-to-asset ratio) tend to give out fewer loans for productive activities because bank capital is tied down whenever bank capital to total asset ratio is high, and this will adversely affect banks' contribution to productive economic activities and economic growth (Martynova, 2015). This explains why greater financial stability in terms of a high capital-to-asset ratio, can negatively affect economic growth in Nigeria.

The INF coefficient is negative and significantly related to real GDP growth rate in the GLM and RLS estimations in columns 2 and 3. This indicates that higher inflation via higher consumer prices, significantly decreases economic growth in Nigeria. The observed negative relationship between inflation and economic growth in Nigeria supports the findings of Gokal and Hanif (2004) who document a negative effect of inflation on economic growth in their study. The explanation for this result is that a high rate of inflation decreases the purchasing

power of Nigerian consumers and increases the cost of production for businesses which compel businesses to decrease output, thereby leading to decrease in economic growth.

The MAC coefficient is positive and significantly related to real GDP growth rate in the OLS, GLM, RLS and quantile regression estimations in columns 1, 2, 3 and 4. This indicates that high macroeconomic management quality has a significant positive effect on economic growth in Nigeria. The explanation for this result is that greater macroeconomic management quality in Nigeria will give rise to low economic policy uncertainty and create an enabling policy environment that allows businesses to thrive in Nigeria. This will stimulate economic activities and lead to higher economic growth in Nigeria.

The NPL coefficient is insignificantly related to real GDP growth rate in the OLS, GLM, RLS and quantile regression estimations in columns 1, 2, 3 and 4. This indicates that banking sector nonperforming loans do not have a significant effect on economic growth in Nigeria. Similarly, the UNEMP coefficient is insignificantly related to real GDP growth rate in the OLS, GLM, RLS and quantile regression estimations in columns 1, 2, 3 and 4. This indicates that the total unemployment rate has an insignificant effect on economic growth in Nigeria. The observed insignificant effect of unemployment on economic growth in Nigeria contradicts existing studies such as Darma and Onimisi (2017) who document a significant effect of unemployment on economic growth.

Table 4. Determinants of economic growth in Nigeria: full sample analysis (sample period: 2007-2022)				
Variable	(1)	(2)	(3)	(4)
	Ordinary least squares (OLS) Regression	Generalized linear model (GLM) regression	Robust least squares (RLS) regression	Quantile regression
	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
FIC	-0.005**	-0.005**	-0.0006***	-0.007
	(0.01)	(0.00)	(0.00)	(0.21)
FSB	-0.2004	-0.2004*	-0.202	-0.306
	(0.12)	(0.08)	(0.12)	(0.37)
INF	-0.268*	-0.268**	-0.254*	-0.234
	(0.05)	(0.02)	(0.05)	(0.33)
MAC	2.564***	2.564***	2.574***	2.573**
	(0.00)	(0.00)	(0.00)	(0.02)
NPL	0.058	0.058	0.060	0.027
	(0.24)	(0.21)	(0.24)	(0.78)
UNEMP	0.273	0.273	0.240	0.426
	(0.49)	(0.47)	(0.56)	(0.68)
Adjusted R^2	82.03		65.63	54.64
Pearson statistic		1.752		
***, **, * represent statistical significance at the 1%, 5% and 10% level.				

Source: Author's own work

4.3. Economic growth determinants during good economic years

This section examines the determinants of economic growth in Nigeria during good economic years using a non-crisis sub sample. The non-crisis sub sample captures the good economic times or the non-crisis years after excluding the 2007 to 2009 period which captures the global financial crisis and excluding the 2020 to 2022 period which captures the COVID-19 pandemic period. Table 5 reports the OLS, GLM, RLS and quantile regression results for the non-crisis (or good years) sub sample analysis. The FIC coefficient is negative and significantly related to real GDP growth rate in the OLS and GLM estimations in columns 1 and 3. This indicates that higher levels of financial inclusion, through greater number of bank depositors, leads to decrease in economic growth in good economic years in Nigeria. As previously explained, the negative result may be due to the fact that bank-based indicators of financial inclusion are less effective in stimulating economic growth in Nigeria.

The FSB coefficient is negative and significantly related to real GDP growth rate in the OLS, GLM and RLS estimations in columns 1, 2 and 3. This indicates that greater financial stability, via higher capital adequacy ratio, does not lead to a significant increase in economic growth

in good economic years in Nigeria. The observed negative relationship between financial stability and economic growth in good economic years in Nigeria contradicts the findings of Creel et al (2015) and Ozili (2024) who document a positive effect of financial stability on economic growth in their studies. As previously explained, higher capital adequacy even in good times will constrain banks' ability to increase lending. This will limit banks' ability to lend to growth-enhancing activities and it will have an adverse effect on economic growth in Nigeria.

The INF coefficient is negative and significantly related to real GDP growth rate in the OLS, GLM and RLS estimations in columns 1, 2 and 3. This indicates that higher inflation via higher consumer prices, significantly decreases economic growth in good economic years in Nigeria. This implies that high inflation decreases the purchasing power of Nigerian consumers and businesses. It increases the cost of production for businesses and compel businesses to decrease output, thereby leading to decrease in economic growth in Nigeria. The observed negative relationship between inflation and economic growth in good economic years in Nigeria supports the findings of Gokal and Hanif (2004) who document a negative effect of inflation on economic growth in their study.

The MAC coefficient is positive and significantly related to real GDP growth rate in the OLS, GLM, RLS and quantile regression estimations in columns 1, 2, 3 and 4. This indicates that high macroeconomic management quality has a significant positive effect on economic growth in good economic years in Nigeria. This implies that greater macroeconomic management quality in Nigeria will create an enabling policy environment that allows businesses to thrive and grow in Nigeria. It will stimulate economic activities and lead to higher economic growth in Nigeria.

The NPL coefficient is insignificantly related to real GDP growth rate in the OLS, GLM, RLS and quantile regression estimations in columns 1, 2, 3 and 4. This indicates that banking sector nonperforming loans do not have a significant effect on economic growth in good economic years in Nigeria. The observed insignificant effect of bank nonperforming loans on economic growth in good economic years in Nigeria contradicts Töl and Virén (2021) who document a significant effect of bank nonperforming loans on economic growth.

The UNEMP coefficient is positive and significantly related to real GDP growth rate in the OLS and GLM regression estimations in columns 1 and 2. This indicates that high unemployment does not lower economic growth in Nigeria during good economic years in Nigeria. The observed significant positive effect of unemployment on economic growth in good economic years in Nigeria does not support existing studies such as Darma and Onimisi (2017) who document a significant negative effect of unemployment on economic growth. The explanation for this result is that, during good economic times, Nigerian employers will invest heavily in technology and hire fewer workers to produce more goods and services using technological equipment. This will lead to high unemployment and positive economic growth in Nigeria.

Table 5. Determinants of economic growth in good times: subsample analysis (sample period: 2010-2019)

Variable	(1)	(2)	(3)	(4)
	Ordinary least squares (OLS) regression	Generalized linear model (GLM) regression	Robust least squares (RLS) regression	Quantile regression
	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
FIC	-0.008* (0.10)	-0.008** (0.03)	-0.002 (0.53)	-0.003 (0.82)
FSB	-0.671*** (0.009)	-0.671*** (0.00)	-0.536*** (0.00)	-0.512 (0.20)
INF	-0.405** (0.04)	-0.405*** (0.00)]	-0.519*** (0.00)	-0.478 (0.17)
MAC	2.292*** (0.00)	2.292*** (0.00)	2.904*** (0.00)	2.706* (0.08)
NPL	-0.119 (0.41)	-0.119 (0.36)	0.049 (0.59)	0.042 (0.91)
UNEMP	1.243* (0.08)	1.243** (0.02)	0.439 (0.27)	0.521 (0.74)
Adjusted R^2	96.72		53.67	77.07
Pearson statistic		0.292		

***, **, * represent statistical significance at the 1%, 5% and 10% level.

Source: Author's own work

4.4. Effect of climate change and international trade

In this section, we conduct further analysis to determine whether the level of international trade and climate change are potential determinants of economic growth in Nigeria. This analysis is important because it is argued in the literature that higher international trade

activities often lead to increase in the number of exported goods and services which contributes to higher economic output and higher economic growth (Singh, 2010; Gokmenoglu et al, 2015). It is also argued that climate change can hinder economic growth because climate change events, such as floods, mudslide, and heat waves, can damage the factors of production that are used to produce goods and services which contribute to economic growth such as machinery, land, and labour (Dell et al, 2008; Roson and Van der Mensbrugghe, 2012). This indicates that climate change should have a negative impact on economic growth while the level of international trade should have a positive impact on economic growth. In the analysis, the level of international trade is measured using the ratio of merchandise trade to GDP (MTG) because Nigeria has a large share of merchandise trade compared to services trade. Climate change is measured using the ratio of CO2 emissions from solid fuel consumption to total emission (CCL). The MTG and CCL variables are incorporated into the model in equation 2 and the results are reported in table 6.

$$GDPRt = FICt + FSBt + INFt + MACt + NPLt + UNEMPt + MTGt + CCLt + et \ldots\ldots eqn\ 2$$

The variables of interest are the MTG and CLL variables. The MTG coefficient does not have a significant effect on real GDP growth rate in the OLS, GLM, RLS and quantile regression estimations in columns 1, 2, 3 and 4 of table 6. This indicates that merchandise trade has an insignificant effect on economic growth in Nigeria. The insignificant result is due to the nature of merchandise trading in Nigeria and the distortions in the transmission mechanism through which trade contributes to economic growth in Nigeria. Furthermore, the observed insignificant effect of merchandise trade on economic growth in Nigeria contradicts existing studies such as Singh (2010) and Gokmenoglu et al (2015) who document a positive effect of international trade on economic growth in other country contexts.

The CCL coefficient does not have a significant effect on real GDP growth rate in the OLS, GLM, RLS and quantile regression estimations in columns 1, 2, 3 and 4. This indicates that climate change, in terms of CO2 emission, has an insignificant effect on economic growth in Nigeria. The insignificant result may be due to the way in which climate change is measured in this study. Furthermore, the observed insignificant effect of climate change on economic growth in Nigeria contradicts existing studies such as Dell et al (2008) and Roson and Van der

Mensbrugghe (2012) who document a negative effect of climate change on economic growth in other country contexts.

Table 6. Effect of climate change and international trade on economic growth (period: 2007-2022)

	(1)	(2)	(3)	(4)
	Ordinary least squares (OLS) regression	Generalized linear model (GLM) regression	Robust least squares (RLS) regression	Quantile regression
Variable	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
FIC	-0.017 (0.16)	-0.017** (0.03)	-0.017* (0.08)	-0.011 (0.63)
FSB	-0.251 (0.26)	-0.252 (0.12)	-0.243 (0.20)	-0.143 (0.75)
INF	0.114 (0.77)	0.114 (0.74)	0.092 (0.82)	-0.067 (0.94)
MAC	4.918 (0.15)	4.918** (0.02)	4.825* (0.05)	3.403 (0.58)
NPL	-0.012 (0.89)	-0.013 (0.87)	-0.011 (0.91)	-0.012 (0.94)
UNEMP	0.348 (0.67)	0.348 (0.62)	0.319 (0.70)	-0.445 (0.86)
MTG	-0.161 (0.44)	-0.161 (0.34)	-0.150 (0.44)	0.005 (0.99)
CCL	-18.516 (0.75)	-18.516 (0.71)	-15.177 (0.79)	45.944 (0.81)
Adjusted R^2	96.60		77.03	24.63
Pearson statistic		1.316		

**, * represent statistical significance at the 5% and 10% level.

Source: Author's own work

5. Conclusion

The study examined the determinants of economic growth in Nigeria. It examined the effect of financial inclusion, inflation rate, financial stability, bank nonperforming loans, macroeconomic management quality and the unemployment rate on economic growth in Nigeria over the 2007 to 2022 period. The determinants were analyzed using the ordinary least squares regression method, the generalized linear model regression method, the robust least squares regression method, and the quantile regression method.

It was found that financial inclusion, inflation rate and macroeconomic management quality are significant determinants of economic growth in Nigeria while bank nonperforming loans, unemployment rate, international trade and climate change have an insignificant effect on economic growth in Nigeria. It was also found that financial inclusion, inflation rate, financial stability, macroeconomic management quality and the unemployment rate are significant determinants of economic growth in good economic years in Nigeria.

The implication of the findings is that some well-known catalysts of economic growth, such as financial inclusion and financial stability, are not positive catalysts of economic growth in Nigeria because the findings reveal that higher levels of financial inclusion and financial stability can hinder economic growth in Nigeria due to Nigeria's unique business environment and regulatory peculiarities.

The social impact of the findings is that policymakers can introduce interventions such as public works and welfare benefit schemes that increase employment, accelerate financial inclusion, foster social inclusion, and stimulate economic growth. Such interventions can influence public attitudes by stimulating people to use available formal financial services towards financial inclusion, take up available employment opportunities and engage in business or trade activities that promote sustainable economic growth.

The study bridges the gap between theory and practice by establishing a relationship between macro financial variables and economic growth in Nigeria based on the theoretical underpinnings of the finance and growth theory which states that financial services, financial instruments, financial institutions, and banks can contribute positively to the process of economic growth. The implication for practice is that the extent to which financial inclusion, financial stability, bank nonperforming loans, inflation, macroeconomic management quality and unemployment can contribute to economic growth in Nigeria depends on how economic agents interact with finance, institutions, and regulation to deliver the goods and services that contribute to economic growth in Nigeria.

Several recommendations are offered based on the findings. One, policymakers should find the right level of financial inclusion, financial stability and unemployment that can stimulate economic growth in Nigeria since high levels of financial inclusion, financial stability and unemployment do not stimulate economic growth in Nigeria based on the findings. Two,

policymakers in Nigeria should use sound monetary policy tools to reduce the inflation rate in Nigeria to stimulate economic growth. Three, policymakers should also increase the quality of macroeconomic management to stimulate economic growth.

The limitation of the study is that it did not examine the determinants of economic growth over a long sample period. Another limitation of the study is that this study did not examine other economic factors that may influence economic growth such as cryptocurrency and artificial intelligence developments.

Future research studies can extend this study by examining other economic factors that may influence economic growth such as cryptocurrency and artificial intelligence developments. Future studies can also reexamine this topic using a longer sample period. Future research studies can also extend our analysis to ECOWAS countries or sub-Saharan African countries.

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