Unraveling The Nexus: Capital Flows Dynamics, Financial Sector Stability and Their Impact on Economic Development in Nigeria

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ABSTRACT

Capital flows Dynamics, Financial sector stability and their impact on Economic development in Nigeria was carried out using data from 1986 to 2022. This study attempted to find out the effect of the relationship between financial sector stability variables and capital flows on economic development in Nigeria. The ARDL Error Correction regression analysis was used to test the short run and long run relationship capital outflow and financial sector stability on economic development. The study found out that capital flow variables (NPI and NDI) negatively but significantly affect economic development while financial sector variables (CPS and NIM) exhibited a negative and insignificant relationship with economic development. The study concluded that the influence of capital flows is dependent upon a nation's degree of financial development. A more open capital account has a detrimental impact on performance for nations with low levels of financial development. The study therefore recommends that the policy makers in Nigeria should strike a balance between attracting foreign investment and ensuring that it aligns with broader economic development goals and ensure that credit is directed towards productive sectors that contribute to economic development.

INTRODUCTION

The pursuits of economic development, exchange rate stability, low inflation, financial sector stability and sustainable balance of payment (BOP) have over time been the force behind most economic policies. The realization of these laudable objectives has no doubt been constrained by the interplay of factors, among, which include low level of domestic savings and investment and foreign exchange shortage. The emergence of integrated financial markets and high capital mobility made possible by the increasing globalization of world economies, has predisposed economies, especially developing ones to the volatility of capital flows, dependence on financial sector for capital and loss of market confidence, which often result in severe financial crises.

Capital flows dynamics refer to the movement of funds into and out of a country, which can be in the form of foreign direct investment (FDI), portfolio investments, or remittances. These capital flows play a significant role in shaping the financial sector's stability and overall economic development in Nigeria.

The stability of the financial sector is vital for fostering economic growth as it ensures efficient allocation of resources, promotes financial inclusion, and reduces systemic risks. A well-functioning financial sector can facilitate capital mobilization, channel funds to productive sectors, and support entrepreneurship and innovation.

However, capital flows dynamics can also pose challenges to financial stability. Sudden capital outflows, for example, can lead to currency depreciation, inflation, and financial market volatility. Improperly managed capital flows can also increase vulnerability to external shocks and undermine economic growth prospects.

Most developing countries are characterized by low level of domestic savings, which has impeded the much-needed investment for economic development. In order to attain a desirable level of investment that would

ensure sustainable development, developing country needs some foreign savings to bridge the savings-investment gap. The gap when financed through foreign savings comes in form of capital flows. Capital flows is transmitted through foreign direct reserves, foreign loans and credits etc (Obadan, 2004).

Capital flows in terms of portfolio investment has been a notable feature of developed economies. This, however, is becoming a very important component of the balance of payments of many emerging economies, such as China, Hong Kong, India, Singapore, Taiwan, Brazil, South Africa etc (Obadan, 2004).

In Nigeria, the abrogation of certain laws and subsequent entrenchment of investment friendly laws as well as the introduction of structural reforms facilitated the substantial flow of capital. Until 1986, Nigeria did not record any figure on portfolio investment (inflow or outflow) in her BOP accounts. This was attributable to the non-internationalization of the country ‘s money and capital markets as well as the non-disclosure of information on the portfolio investments of Nigerian investors in foreign capital/money markets (CBN 1997:151). For example, the net portfolio investment (NPI) and net direct investment (NDI) were N151.6 million and N735.8 million in 1986, which rose to N51, 079.13 million and N115, 952.2 million in 2000, indicating a growth rate of 33,593.36 and 15,658.66 per cent, respectively. In 2005, NPI and NDI went up to N116, 035.00 million and N654, 193.10 million indicating a growth rate of 127.17 and 464.19 per cent, respectively, compared with the 2000 figures. Furthermore, NPI and NDI outflow supersedes inflow to N560498.52million and N124645.02 million in 2008, respectively, this figure further decreases to about 329409million and 84768.5million in 2015. Also, in 2022 NPI decline to 294350million while NDI increase to 28535.65million.CBN (2022)

In recent years, Nigeria has experienced significant fluctuations in capital flows, accompanied by varying degrees of instability in its financial sector. This phenomenon has prompted a growing interest in understanding the intricate relationship between capital flows dynamics, financial sector stability, and their implications for economic development in the country. This research endeavors to delve into this complex nexus to shed light on the underlying mechanisms and potential policy implications.

Despite Nigeria's status as one of Africa's largest economies, it has grappled with persistent challenges related to capital flows volatility and financial sector fragility. The erratic nature of capital inflows and outflows, coupled with vulnerabilities within the financial system, has posed considerable hurdles to sustainable economic growth and development. Moreover, the interplay between these factors remains poorly understood, hindering the formulation of effective policy measures to mitigate risks and harness opportunities for economic advancement.

The study will provide valuable insights into the drivers and determinants of capital movements, enabling policymakers to adopt proactive measures to manage volatility and enhance resilience. It will create a better understanding of how fluctuations in capital flows impact financial sector stability is crucial for safeguarding the integrity of the banking system and promoting investor confidence

Moreover, this research holds significance not only for Nigeria but also for broader debates surrounding emerging market economies and their quest for sustained growth and resilience in an interconnected world. By shedding light on the nuanced interrelationships between capital flows, financial sector stability, and economic development, it seeks to inform policymakers, practitioners, and scholars alike, offering insights that can guide policy formulation, risk management strategies, and institutional reforms. In doing so, it aspires to contribute to the advancement of knowledge and the pursuit of inclusive and sustainable development in Nigeria and beyond at fostering sustainable and inclusive growth in Nigeria. By addressing these issues, this research seeks to contribute to the ongoing discourse on economic policy formulation and implementation in the country, with the ultimate goal of fostering a more robust and resilient economy.

The paper is structured into 5 sections. Following the introduction is section 2, which reviews the theoretical literature. In section 3 is the methodology. Section 4, deals with the analysis. Finally, section 5 discusses the summary, conclusion as well as recommendations.

LITERATURE REVIEW

This section reviews the relevant literature on capital flows dynamics, financial sector stability, and economic development. To enhance clarity, the review is divided into three subsections: theoretical review, empirical review, and contextual review. The theoretical review discusses foundational theories underpinning the study. The empirical review examines global studies on the relationships among the variables. The contextual review focuses on Nigeria-specific studies and evidence to situate the research within the local economic landscape.

THEORETICAL REVIEW

Two theories underpinned this study they are the Internalization theory and the integrated financial liberalization and financial repression theory seeks Internalization theory, initially proposed by Stephen Hymer in the 1960s and further developed by other scholars such as John Dunning, addresses why firms engage in foreign direct investment (FDI) instead of merely conducting international trade or licensing agreements. The theory suggests that firms undertake FDI to internalize market imperfections and gain control over foreign assets, thereby maximizing their profits. Internalization theory starts with the recognition of market imperfections, such as imperfect information, transaction costs, and incomplete contracts. In a perfect market, firms would have no incentive to invest abroad; they could simply trade or license their products or technologies. However, in the real world, these market imperfections exist and create inefficiencies that firms seek to overcome.

The theory suggests that firms internalize foreign operations to capture the benefits of coordination, control, and coordination economies. By owning and managing foreign subsidiaries, firms can coordinate production, marketing, and distribution activities more efficiently, reducing transaction costs and enhancing overall profitability.

John Dunning extended Hymer's ideas and proposed the OLI framework, which combines three factors - Ownership advantages (O), Location advantages (L), and Internalization advantages (I). According to Dunning, firms engage in FDI when they possess ownership advantages, operate in locations with attractive investment opportunities (such as favorable market conditions, resources, or infrastructure), and can internalize the benefits of control and coordination.

In summary, internalization theory provides a compelling explanation for why firms engage in FDI by highlighting the role of market imperfections and the advantages of internalizing foreign operations. By gaining control over foreign assets and activities, firms can exploit their ownership advantages more effectively, reduce transaction costs, and enhance their competitiveness in the global marketplace.

The Integrated financial liberalization and financial repression theory was propounded by economists such as Joseph Stiglitz, Dani Rodrik, and Ha-Joon Chang. They argue that a balanced approach to financial sector development, which combines market discipline with government oversight, is essential for achieving sustainable and inclusive economic growth. By harnessing the benefits of financial liberalization while mitigating its potential downsides, countries can create a more resilient and equitable financial system that supports long-term development objectives.

The other theory, the integrated financial liberalization and financial repression theory seeks to reconcile the potential benefits and risks associated with financial liberalization and government intervention in the financial sector. The theory recognizes that both approaches have their advantages and disadvantages, and proposes a balanced approach that combines elements of liberalization with regulatory measures to promote economic development while mitigating financial instability.

Proponents of this theory argue that financial liberalization can stimulate economic growth by fostering competition, innovation, and efficiency in financial markets. By removing restrictions on capital flows, interest rates, and financial intermediation, liberalization allows for greater access to credit, encourages investment, and facilitates the allocation of resources to their most productive uses. This, in turn, can lead to higher levels of investment, employment, and overall economic development.

However, proponents also acknowledge the potential risks associated with unchecked financial liberalization, including increased volatility, asset bubbles, and systemic instability. Financial markets may become more prone to speculative excesses, leading to boom-bust cycles and financial crises. Moreover, liberalization can exacerbate income inequality and exacerbate social tensions if the benefits accrue disproportionately to a small segment of the population.

To address these concerns, proponents of integrated financial liberalization advocate for a regulatory framework that combines market-oriented policies with prudential measures to ensure financial stability and promote inclusive growth. Regulatory interventions may include capital adequacy requirements, liquidity standards, risk management guidelines, and consumer protection measures. Additionally, macroprudential tools such as reserve requirements, loan-to-value ratios, and countercyclical buffers can help mitigate systemic risks and dampen excessive credit expansion during economic booms.

Empirical review

Capital inflows may lead to improvement in the financial sector to reduce vulnerability to crisis, and have a positive impact on macroeconomic stability in financially open economies (Kose et al. 2010). As the financial sector becomes more developed, the growth benefits of capital flows will improve. Bekaert and Harvey (2000), for instance, found that with increased capital flows, risk is reduced, equity returns become highly correlated with the world market, per capita GDP increases marginally, and inflation and foreign exchange rate volatility are lowered.

Macroeconomic stability has implications for the volume and composition of capital flows, as developed financial markets moderate the effects of shocks and helps reduce macroeconomic volatility (Kose et al. 2010). Macroeconomic implications of financial globalization are experienced through the effects on economic growth and growth volatility (Kose et al. 2010). Thus, capital inflows enhance growth more in countries with strong macroeconomic policies and where there is macroeconomic stability (Eichengreen 2000). Policy also plays a significant role in explaining changes in the level of inflows and their volatility. Alfaro, Kalemli-Ozcan, and Volosovych 2007.

Variations in capital flows to developing countries are mostly explained by shocks to real variables of economic activity, such as foreign output and domestic productivity. De Vita and Kyaw (2008). The impact of capital flows also depends on the level of financial development of a country. Countries at low levels of financial development experience a negative effect on performance, in the case of a more open capital account Edwards (2001). Choong et al. (2010) found private capital flows to positively impact growth in countries with well-developed financial sectors but have negative effects in situations of poor financial sector development. The level of capital flows, however, depends on the degree of market integration, which is measured by differences in rates of return across countries (Frankel 1992). As Mohan and Kapur (2010) found, the increasing volume of private capital flows to emerging market economies depends on, among other factors, their growing degree of financial openness over time, growth in overall profitability of firms, positive interest differentials in favor of these economies, and the expectation of continuing currency appreciation.

The link between capital flows, financial sector stability and economic development has been studied by testing their causal relationship individually. Studies on the relationship between capital flows and growth, and financial stability and growth however, are inconclusive in their findings.

Harley T.W and Akinola A. T (2018) studied the impact of capital flows on the financial system stability of the Nigeria economy using data from 1987 to 2017. The study found out that credit to private sector negatively affect foreign direct investment. The coefficient of determination in the study was high indicating that the explanatory variables (financial system stability variables) are captured by the capital flows variable (FDI). The study therefore recommended that the Nigeria government should adjust the model for credit to private sector so as to have a positive relationship with capital flows.

Justine C, (2018). Examined whether sharp capital flow movements, specifically private capital inflow movements, are a significant risk factor for financial stability in Jamaica. A structural vector autoregressive

(SVAR) model was used to assess the dynamic relationship between private capital inflows and financial stability, as well as the responsiveness of financial stability indicators to sudden changes in private capital flows. The findings confirmed a significant relationship between private capital inflows and financial stability and underscores the need to develop macro-prudential measures to curb possible threats to financial stability.

Nyang`oro, O. (2017). Analyzed the effect of capital flows on economic growth in sub-Saharan Africa, using a system of generalized methods of moment (GMM) model. It tests the extent to which the level and volatility of capital inflows, both disaggregated and total, affect economic growth. The study finds that portfolio equity has a positive effect on economic growth while private equity and debt are inversely related to growth. However, volatility of portfolio equity and private equity has no impact on economic growth, pointing to low levels of financial integration in these countries. Total capital inflows, both gross and net inflows, have a negative effect on growth, while volatility of total gross capital inflows has a positive effect, and that of total net capital inflows is positively related to growth. The effect of total capital inflows is possibly influenced by the overall effect of debt in these economies. The findings suggested that concerns on capital inflows should mainly be addressed through the debt market, and that the growth benefits of capital inflows can be achieved by improving financial markets, ensuring macroeconomic stability, and having in place good institutions.

Using cointegration and panel Granger causality tests, Abbes et al. (2015) found economic growth and FDI to be cointegrated in the long run, in a sample of 65 countries from 1980–2010. However, they established a unidirectional causality from FDI to GDP. Albulescu (2015) found both direct and portfolio investments exerted an influence on long-term economic growth; when equity and investment funds instruments were considered, Aizenman, Jinjarak, and Park (2011) found a positive effect of FDI on growth but no effect from portfolio inflows and equity investment, while short-term debt has no effect before a crisis period and a negative effect during the crisis.

Contextual review

However, few studies have examined the capital flow dynamics and financial sector stability on economic development in Nigeria. The literature points to the various macroeconomic variables that are affected by capital Inflows and financial stability. The effects are not standard across countries, as they depend mainly on the type of capital flowing to a country, the level of financial development, and the macroeconomic state of a country.

Despite empirical studies on the link between capital flows, financial sector stability and economic development, limited attempts have been made to connect financial sector stability and volatility of capital flows. This study establishes the individual relationship between the level and volatility of capital inflows and economic development; financial sector stability and economic development. Capital inflows, measured using net foreign direct investment and net portfolio investment while financial sector stability is measured using credit to private sector and net interest margin to test their differential effects on macroeconomic variables.

METHODOLOGY

This study seeks to determine the impact of capital flow dynamics and financial sector stability on economic development in Nigeria This section discusses the research design, model specification, variables used, sources of data, and finally, estimation technique and procedure used for the study.

Research design

Given the nature of this research, the study made use of annual time series data to determine the relationship between capital flow and financial sector variables on economic development in Nigeria. The study employed the ARDL Bounds test analytical technique. The secondary data covering the period of 1986 to 2022 will be used.

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Model Specification

The main objective of this study is the impact of capital flows on financial system stability of the Nigeria economy. It applies the ARDL Bounds test analytical technique based on the traditional determinants of financial stability and capital flows distilled from the literature. The idea is to subject the variables to a linear model and test the impacts of financial stability variables and capital flows on economic development. We describe the indicators used, data sources, and the estimation technique applied in the empirical investigation of the relationship between capital flows and financial stability. For the time period 1986–2022, a set of financial indicators was used to measure financial system stability, gross capital flows, and a macroeconomic variable as control variable.

In order to account for the impact of capital flows on financial system stability of the Nigeria economy, the model for the study is hereby specified as follows:

Model 1: capital flow and economic development

$GDP = a_0 + \alpha_1 NPI + \alpha_2 NDI + \alpha_3 EXRATE + \alpha_4 INF + \varepsilon_t$ …… 1

Model 2: financial sector and economic development

$GDP = a0 + \alpha_1 CPS + \alpha_2 NIM + \alpha_3 EXRATE + \alpha_4 INF + \varepsilon_t$ …… 2

Where:

GDP = gross domestic product per capita (proxy for economic development)

NPI = Net port-folio investment (proxy for capital flow)

NDI = Net Direct investment (proxy for capital flow)

CPS = credit to private sector

NIM = net interest margin

EXRATE = exchange rate

INF = inflation rate

Apriori Expectation

Foreign port-folio investment and foreign direct investment are proxy for capital flows and it is expected that FPI and FDI be should be positive

Net interest margin is expected that increase in interest margin should lead to increase in financial system stability

Credit to private sector is expected that an increase in credit to the private sector should lead to increase in the Nigeria financial system stability

Inflation rate is expected that high inflation rate will impede the Nigeria financial system stability.

Exchange rate fluctuations can influence foreign investment flows. A weaker currency may attract foreign investment which can boost domestic income. Conversely, a strong currency might discourage foreign investment or even lead to capital flight.

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Description of Variables

GDP per capita is selected as a proxy for economic development consistent with global development literature. Net Portfolio Investment (NPI) and Net Direct Investment (NDI) measure capital flow dynamics as reported by the CBN. Credit to Private Sector (CPS) and Net Interest Margin (NIM) capture financial sector stability, following indicators recommended by the IMF and World Bank. Inflation and exchange rate are included as control variables commonly affecting macroeconomic stability (Kose et al., 2010).

Estimation technique

Unit root test

In time series analysis, before running the co-integration test the variables must be tested for stationarity. For this purpose, we use the conventional ADF tests to test for stationarity.

Co-integration Approach

This study relies on the ARDL bounds test approach to co-integration developed by Pesaran et al., (2001) to test for cointegration. The ARDL bounds test approach to co-integration has been demonstrated to perform better than other traditional cointegration methods. This is because of its numerous advantages over other long run estimation techniques. It can be applied on variables that are either I(1) or I(0) or combination of the two and the approach yields unbiased estimates and its t-statistics are effective even if some of the regressors are endogenous (Harris & Sollis 2003).

Model Justification

The ARDL approach is adopted due to its flexibility in handling variables integrated at both I(0) and I(1), its efficiency in small sample sizes, and its ability to provide both long-run and short-run estimates (Pesaran et al., 2001). ARDL also mitigates endogeneity concerns that frequently appear in macroeconomic datasets.

Thus, we specified conditional general form of the ARDL model in equation 3 and 4

$$\Delta GDP_t=\alpha_0+\alpha_1 GDP_{t-1}+\alpha_2 NPI_{t-1}+\alpha_3 NDI_{t-1}+\alpha_4 EXRATE_{t-1}+\alpha_5 INF_{t-1}+ \sum_{\square=\square}^{\square}\theta_{\square 1}\Delta GDP_{t-1}+\sum_{\square=\square}^{\square}\theta_{\square 2}\Delta NPI_{t-1}+\sum_{\square=\square}^{\square}\theta_{\square 3}\Delta NDI_{t-1}+\sum_{\square=\square}^{\square}\theta_{\square 4} EXRATE_{t-1}+\sum_{\square=\square}^{\square}\theta_{\square 3} INF_{t-1}+\mu t \quad \ldots\ldots (3)$$

$$\Delta GDP_t=\alpha_0+\alpha_1 GDP_{t-1}+\alpha_2 NIM_{t-1}+\alpha_3 CPS_{t-1}+\alpha_4 EXRATE_{t-1}+\alpha_5 INF_{t-1}+\sum_{\square=\square}^{\square}\theta_{\square 1}\Delta GDP_{t-1}+\sum_{\square=\square}^{\square}\theta_{\square 2}\Delta NIM_{t-1}+ \sum_{\square=\square}^{\square}\theta_{\square 3}\Delta CPS_{t-1}+\sum_{\square=\square}^{\square}\theta_{\square 4} EXRATE_{t-1}+\sum_{\square=\square}^{\square}\theta_{\square 3} INF_{t-1}+\mu t \quad \ldots\ldots (4)$$

Where: GDP, NPI, NDI, NIM, CPS, EXRATE, and INF remain as previously defined. Similarly, α denotes the drift, v denotes the lag lengths, $\alpha_1 - \alpha_5$ are coefficients to be estimated while ln denotes natural logarithms and μt is the stochastic error term

Since the aim of the study is to understand both short and long run dynamics of capital flows, financial sector impact on economic development in Nigeria, specification of the long run and short run ARDL approach is important. Hence, the long run model is expressed in equation 5 and 6 below:

$$GDP_t=\alpha_0+\sum_{\square=1}^{\square}\alpha_1 GDP_{t-1}+\sum_{\square=\square}^{\square}\alpha_2 NPI_{t-1}+\sum_{\square=\square}^{\square}\alpha_3 NDI_{t-1}+\sum_{\square=\square}^{\square}\alpha_4 EXRATE_{t-1}+\sum_{\square=\square}^{\square}\alpha_5 INF_{t-1}+ \mu t \quad \ldots\ldots (5)$$

$$GDP_t=\alpha_0+\sum_{\square=1}^{\square}\alpha_1 GDP_{t-1}+\sum_{\square=\square}^{\square}\alpha_2 NIM_{t-1}+\sum_{\square=\square}^{\square}\alpha_3 CPS_{t-1}+\sum_{\square=\square}^{\square}\alpha_4 EXRATE_{t-1}+\sum_{\square=\square}^{\square}\alpha_5 INF_{t-1}+ \mu t \quad \ldots\ldots (6)$$

Similarly, to estimate the short run parameters of the model when the long run equilibrium exist, the unrestricted ARDL of error correction model is estimated as captured in equation (7 and 8):

$\Delta GDP_t = \alpha 0 + \sum_{i=1} \alpha_1 \Delta GDP_{t-1} + \sum_{i=1} \alpha_2 \Delta NPI_{t-1} + \sum_{i=1} \alpha_3 \Delta NDI_{t-1} + \sum_{i=1} \alpha_4$

$\Delta EXRATE_{t-1} + \sum_{i=1} \alpha_5 \Delta INF_{t-1} + \theta ECM_{t-i} + \mu t$ ..... (7)

$\Delta GDP_t = \alpha 0 + \sum_{i=1} \alpha_1 \Delta GDP_{t-1} + \sum_{i=1} \alpha_2 \Delta NIM_{t-1} + \sum_{i=1} \alpha_3 \Delta CPS_{t-1} + \sum_{i=1} \alpha_4$

$\Delta EXRATE_{t-1} + \sum_{i=1} \alpha_5 \Delta INF_{t-1} + \theta ECM_{t-i} + \mu t$ ..... (8)

Where α_1, α_2, α_3, α_4 and α_5 are short-run coefficients of the ARDL model, α_0 is the constant, θ is the speed of adjustment in the system and ECM denotes the stochastic error term.

Diagnostic Tests

Diagnostic tests were applied to validate model reliability.

- Serial correlation was assessed using the Breusch–Godfrey LM test.

- Heteroskedasticity was evaluated using White's test.

- Normality was confirmed using the Jarque–Bera statistic.

- Model stability was verified using CUSUM and CUSUMSQ tests, following Brown et al. (1975).

Analysis

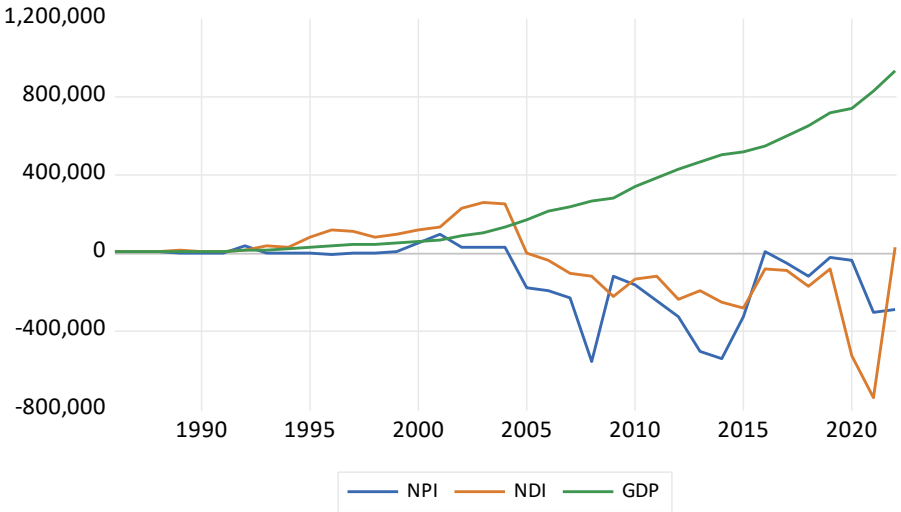
This section presents the results of the various estimation techniques used to achieve the objective of the study.

Statistical Data Analysis

The graphical analysis of the time series of variables is presented in this section.

Graphical Presentation of Data

Figure 1: Net Port-folio investment, Net Direct Investment and GDP per capita from 1986-2022



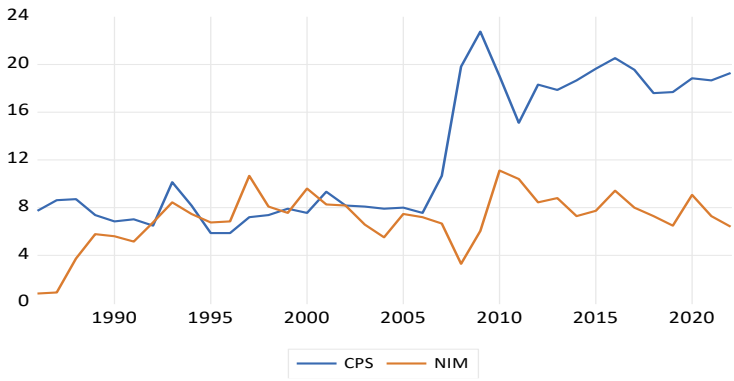
Capital Flows, Financial Market and Economic Growth in Nigeria

The introduction of Structural Adjustment Programme (SAP) in 1986 marked an epoch in the liberalization of the Nigerian economy. Prior to the period, the economy was predominantly regulated, that affected the free movement of capital necessary for economic growth. SAP heralded a lot of policy reforms that led to the publication of an Industrial Policy for Nigeria in January 1989. Critical policy reforms leading to the changes in the investment climate in Nigeria for both domestic and foreign investors (provision of enormous

opportunity to participate in the economy) were the abrogation of the Nigerian Enterprises Promotion Decree 1989 and the Exchange Control Act of 1962 as well as their subsequent replacements with the Nigerian Investment Promotion Council Decree No 16 of 1995 and Foreign Exchange (Monitoring and Miscellaneous Provisions) Decree 17 of 1995. As mentioned earlier, the country did not record any NPI on her BOP until 1986. Onosode (1997) posited that between July 1995 and July 1996, about US$6.0 million foreign portfolio investment (FPI) was made in the Nigerian capital market through the Nigerian Stock Exchange (NSE) for the first time since 1962, while for the whole of 1996, foreign investment through the Nigerian Stock Exchange totaled UD$32.99 million.

In 1986, the NPI in Nigeria was N151.6 million. It rose to N51, 079.13 million in 2000. By 2005, there was a tremendous increase in the NPI figure in Nigeria. It increased from N51, 079.13 million to N116, 035.00 million from 2000 to 2005, (a growth rate of 127.17 per cent). It marked the period when the banks were statutorily mandated to shore up their capital base from mere N2.0 billion to N25.0 billion. It rose to a record level of N231942 million in 2007 before declining to N122347 Million in 2009 and further decline to 309158 and 294350 in 2021 and 2022 respectively. Similarly, the NDI was N735.8 million in 1986 and rose to N115, 952.16 million in 2000. It further increased from N654, 193.10 million in 2005 to N1, 779,594.80 million in 2006, indicating a growth rate of 172.02 per cent. There was a net outflows of direct investment to N109, 161million and 124,645million in 2007 and 2008 respectively before rising to N28535.65 million in 2022. During this period, GDP per capita was N2809.015million in 1986. It rose to N57, 489.92million in 2000 and stood at N925, 981.1 in 2022. Comparatively, the NPI and NDI recorded an average annual figures of N108,658million and N50,567.8million during 1986 - 2022.

Figure 2: credit to private sector and net interest margin



Likewise, in figure 2 above there was evidence of fluctuation in the financial sector variables, as credit to private sector and net interest margin shows a period of increase and decrease. CPS was at its highest in 2009, as a result of some reforms in the financial sector, this period NIM was at its lowest. This was to in other to attract investment in the economy.

Unit Root Tests

Table 1, summarizes the results obtained for each variable from the various techniques used to test the hypothesis of unit root or no unit root as the case may be.

Table 1: ADF Unit Root Tests for all Variables

Variables	Levels	First Difference	Order of Integration
GDP		-4.158658	I (1)
NPI		-6.439144	I (1)
NDI		-4.296517	I (1)
CPS		-3.912883	I (1)

NIM	-3.550393		I (0)
EXRATE		-5.604783	I (1)
INF		-4.296517	I (1)

Source: Authors' computation using (EVIEWS 12)

The Augmented Dickey Fuller (ADF) unit test results shows that all the variables are stationary at first difference except net interest margin (NIM) which is stationary at levels.

Model Estimation

Following the unit root which shows all variables are stationary at first different and levels, there is an econometric justification to apply the ARDL estimation technique. As such, the ARDL bond test and coefficient estimation was used for each of the specified model and the result is presented as follows;

Model 1 on Capital outflow and economic development

TABLE 2 ARDL Bond Test Result for Model 1

Model	F Statistics	5% Critical value		Decision
Equation 1	10.70	I(0)	I(1)	Co- integration
		2.56	3.49	

Source: Authors' computation using (EVIEWS 12)

The ARDL bounds test is based on the assumption that the variables are I (0) or I (1) as shown above in the unit root table. The results of the ARDL bounds testing approach are presented in table (2) indicating that the computed F-statistics for explanatory variables was (10.70). The f- bound test statistics of (10.70) exceeds upper critical bound (3.49) at 5% level of significance. This finding supports that co-integrating relationship exists and confirms the stable long-run relationship between the variables. This implies that the null hypothesis of no co-integration among the variables is rejected.

Table 3: ARDL Error Correction (ECM) Regression for Model 1

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-0.013927	0.102822	-0.135448	0.8956
D(GDP(-2))	-0.154846	0.125238	-1.236412	0.2514
D(GDP(-3))	-0.841945	0.127750	-6.590578	0.0002
D(NPI)	-0.091612	0.010196	-8.985434	0.0000
D(NPI(-1))	0.071996	0.008726	8.251156	0.0000
D(NPI(-2))	0.033161	0.009821	3.376459	0.0097
D(NPI(-3))	0.021692	0.009744	2.226172	0.0566
D(NDI)	-0.016124	0.008013	-2.012099	0.0790
D(NDI(-1))	0.048507	0.015141	3.203804	0.0125
D(NDI(-2))	0.039730	0.014266	2.785007	0.0237
D(NDI(-3))	0.133823	0.017127	7.813651	0.0001
D(EXRATE)	55.55277	44.54259	1.247183	0.2476
D(EXRATE(-1))	-333.3141	69.30068	-4.809680	0.0013
D(EXRATE(-2))	-330.7031	61.57887	-5.370399	0.0007
D(EXRATE(-3))	-155.0810	51.42325	-3.015776	0.0167
D(INF)	-199.0215	62.28771	-3.195197	0.0127
D(INF(-1))	-106.1070	62.78011	-1.690137	0.1295
D(INF(-2))	-274.0704	58.78612	-4.662161	0.0016
D(INF(-3))	-76.76570	52.94694	-1.449861	0.1851
CointEq(-1)*	-0.247472	0.024218	-10.21838	0.0000

R-squared	0.999920	Mean dependent var	286690.9
Adjusted R-squared	0.999682	S.D. dependent var	277200.5
S.E. of regression	4945.404	Akaike info criterion	19.94839
Sum squared resid	1.96E+08	Schwarz criterion	21.08211
Log likelihood	-304.1484	Hannan-Quinn criter.	20.32985
F-statistic	4188.791	Durbin-Watson stat	2.063749
Prob(F-statistic)	0.000000		

The result showed that R^2 (R-Squared) value of 0.999 was obtained. This implies that 99% of the variations in economic development is explained by changes in net port-folio investment, net direct investment, exchange

rate and inflation. The F-Statistics of 4188.791 is significant considering the probability value. This implies that the model has goodness of fit. The Durbin-Watson value of 2.06 which is approximately 2 indicates that there exists no serial correlation. The error correction model (ECM) for economic development is specified, following the Representation Theorem specified. The primary reason for this is to capture the dynamics in economic development and capital flow in the short-run and identify the speed of adjustment as a response to departures from the long-run equilibrium. Thus, the general specification framework of the ECM is shown in Table 3.

Statistically, the ECM term is negative and significant at 5% probability level. The existence of short run equilibrium among the time series in economic development and capita flow is validated by this result. The slope coefficient of the error term in absolute terms (0.247) represents the speed of adjustment and is consistent with the hypothesis of convergence towards the long-run equilibrium once economic development and capital flow equation fluctuates from its equilibrium in the short run. The coefficient of the ECMt-1 suggests that economic development adjusts to the explanatory time series as about 25 percent of the discrepancy between long-run and short-run is corrected annually in the country, which is very low.

The coefficient of net port-folio investment (-0.091612) exert a negative but significant relationship with economic development (GDP) in the current period. Since, NPI (Net Private Investment) is negative and statistically significant to GDP, as this does not conform to a priori expectation, it suggests that decreases in private investment have a significant negative impact on GDP. The policy implication of this finding would be for policymakers to focus on measures to stimulate private investment in order to support GDP growth. Such as; Investment incentives, Infrastructure spending, Access to finance and Economic stability measures. However, NPI lagged one and two with coefficient (0.071996 and 0.033161) respectively are both positive and statistically significant to GDP that is a 1% increase in net portfolio investment will lead to 7.2% and 3.3% increase in GDP. It suggests that past increases in net private investment have had a significant positive impact on current GDP. The policy implication of this finding is that policies supporting and encouraging private investment such as incentives, subsides and infrastructural development could be effective in stimulating economic development.

Similarly, Net direct investment with coefficient (-0.016124) has a negative and insignificant relationship with GDP. This implies that current levels of net direct investment do not have a statistically significant impact on GDP. However, the coefficient of NDI at lag 1, 2 and 3 has a positive and significant impact with GDP, which suggests that past levels of net direct investment have a significant positive effect on GDP. The policymakers should encourage long-term investment, promote stability and address barriers to investment to support sustained economic development.

The coefficient of exchange rate shows a positive and insignificant relationship in the current period to GDP, while lagged exchange rates at one, two, and three periods are positive and statistically significant to GDP, it suggests that past changes in the exchange rate have a significant impact on current GDP, but the current exchange rate alone does not influence GDP significantly. Policymakers may need to focus on maintaining exchange rate stability over the long term to support economic development. Volatility in exchange rates could disrupt economic activity and hinder growth, especially as past fluctuations have had significant impacts on GDP.

Finally, the coefficient of inflation rate (-274.07) is negative and significant at lag 2 which implies that past inflation rate has a negative and significant relationship with GDP. This implies that decrease in inflation two periods ago is associated with an increase in GDP. That is, lower inflation levels in the recent past have a positive effect on economic output.

Table 4: Long run ARDL

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3260.083	7382.140	-0.441618	0.6705
GDP(-1)*	-0.247472	0.056334	-4.392927	0.0023
NPI(-1)	-0.144496	0.025544	-5.656854	0.0005
NDI(-1)	-0.130334	0.035110	-3.712118	0.0059
EXRATE(-1)	722.5001	104.9756	6.882553	0.0001
INF(-1)	187.7960	169.7986	1.105993	0.3009
D(GDP(-1))	-0.013927	0.179890	-0.077420	0.9402
D(GDP(-2))	-0.154846	0.187353	-0.826496	0.4325
D(GDP(-3))	-0.841945	0.203732	-4.132613	0.0033
D(NPI)	-0.091612	0.016445	-5.570888	0.0005
D(NPI(-1))	0.071996	0.015816	4.551987	0.0019
D(NPI(-2))	0.033161	0.017758	1.867358	0.0988
D(NPI(-3))	0.021692	0.016908	1.282953	0.2354
D(NDI)	-0.016124	0.013569	-1.188256	0.2688
D(NDI(-1))	0.048507	0.033001	1.469858	0.1798
D(NDI(-2))	0.039730	0.027972	1.420349	0.1933
D(NDI(-3))	0.133823	0.026929	4.969475	0.0011
D(EXRATE)	55.55277	83.35716	0.666443	0.5239
D(EXRATE(-1))	-333.3141	105.1907	-3.168664	0.0132
D(EXRATE(-2))	-330.7031	92.74182	-3.565847	0.0073
D(EXRATE(-3))	-155.0810	81.89616	-1.893629	0.0949
D(INF)	-199.0215	102.1823	-1.947710	0.0873
D(INF(-1))	-106.1070	152.2080	-0.697118	0.5055
D(INF(-2))	-274.0704	102.4690	-2.674667	0.0282
D(INF(-3))	-76.76570	92.98453	-0.825575	0.4330

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPI	-0.583889	0.113563	-5.141523	0.0009
NDI	-0.526661	0.078476	-6.711075	0.0002
EXRATE	2919.527	373.7459	7.811528	0.0001
INF	758.8588	621.2102	1.221581	0.2566
C	-13173.56	28489.17	-0.462406	0.6561

EC = GDP - (-0.5839*NPI -0.5267*NDI + 2919.5267*EXRATE + 758.8588*INF - 13173.5618)

The result presented in Table 4 (Conditional Error Correction Long-run Regression result for economic development) indicates that in the long run, a year lag of (GDP) is significant at 5% level.

The coefficient of NPI (Net Private Investment) to GDP is -0.583 and statistically significant in the long run, it suggests a robust negative relationship between net private investment and economic development over extended periods. This negative coefficient implies that as net private investment increases, GDP or economic development decreases in the long run. This could be as a result of underlying structural weaknesses in the economy that prevent private investment from translating into sustainable economic growth. These weaknesses may include inadequate infrastructure, regulatory barriers, or institutional deficiencies. This can be resolved by implementing structural reforms to address inefficiencies and improve the business environment, thereby enhancing the effectiveness of private investment in driving economic development. Linking to the integrated financial liberalization theory, this negative effect aligns with the argument that unchecked liberalization in economies with low levels of financial development can trigger volatility and asset bubbles (Stiglitz, 2000; Stiglitz & Weiss, 1981).

The coefficient of NDI (Net Direct Investment) to GDP is -0.526 and statistically significant in the long run. It implies that changes in net direct investment levels are inversely associated with changes in GDP. That is, an increase in NDI is associated with a decrease in GDP. Dependence on NDI as a driver of economic growth may pose risks, especially if it exhibits a negative relationship with GDP. Policymakers should consider diversifying sources of investment and other forms of foreign investment to reduce vulnerability to fluctuations in NDI. This finding resonates with internalization theory, which argues that market imperfections, such as imperfect information and high transaction costs limit the ability of firms to internalize the benefits of FDI, a challenge evident in Nigeria's institutional environment (Hymer, 1976; Dunning, 1988)

The coefficient of the exchange rate to GDP is 2919.527 and statistically significant in the long run, it implies a strong positive relationship between the exchange rate and economic development. This positive coefficient suggests that an increase in the exchange rate is associated with an increase in GDP or economic development in the long run. This implies that, a higher exchange rate may attract foreign investment by making domestic assets more attractive to foreign investors. This influx of investment can stimulate economic activity and contribute to development but this is not the situation in Nigeria as depreciation in Naira, as make import

goods more expensive as the country is characterized by over dependences on importation. Policymakers may aim to maintain a stable exchange rate to provide certainty for businesses and investors, thereby supporting long-term economic development.

The coefficient of inflation to GDP is 758.85 but statistically insignificant in the long run, it suggests a lack of robust relationship between inflation and economic development over extended periods. The insignificant coefficient implies that changes in inflation do not have a statistically significant impact on GDP or economic development in the long run. While inflation may not directly impact economic development in the long run, maintaining price stability remains important for preserving consumer purchasing power, fostering confidence, and supporting overall economic stability.

The negative effects of capital flows (NPI and NDI) on development in Nigeria can be attributed to several factors. First, capital flight depletes domestic investment resources, leaving fewer funds for productive activities and leading to reduced GDP growth (Muhammad et al., 2023). Second, high volatility in inflows, driven by external factors like oil prices and global risk aversion, causes currency depreciation and reserve depletion, exacerbating economic instability (IMF, 2016). Third, foreign debt components of capital flows create debt overhang, with servicing costs diverting resources from investment (Okolie & Ruth, 2021). Additionally, poor institutional quality and corruption facilitate illicit outflows, further hindering growth (Muhammad et al., 2023). Nigeria's oil dependency amplifies "Dutch disease," where inflows appreciate the currency, undermining non-oil sectors (Prasad et al., 2006). Weak absorptive capacity due to underdeveloped financial systems prevents efficient allocation of inflows, aligning with the integrated theory's warnings on liberalization risks in low-development contexts.

Diagnostic Tests

The Diagnostic tests for serial correlation, Heteroskedasticity and normality were conducted, and the results are presented in Table 5. The result for serial correlation shows that errors in equation are not serially correlated. The test for Heteroskedasticity indicated that there were equal spreads in variance in the equations of the model with a probability value of 0.8967. The normality test of the equation in the model shows that the equation allows the normal distribution. The Jarque – Bera statistics of 0.699525 with the probability values of 0.704856 shows that the variables in the model are normally distributed.

Table 5: Diagnostic Tests for Model 1

Test	R^2 Statistics	Probability Value
Breusch-Godfrey LM test for Serial correlation	1.962815	0.3748
White Heteroskedasticity	15.75495	0.8967
Normality Test	0.699525	0.704856

Stability Test

It is ideal to investigate the stability of ARDL model. For this purpose, we have checked the stability of the model parameters using both cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) test procedures. CUSUM and (CUSUMSQ) are plotted against the break points. The plot of the CUSUM and (CUSUMSQ) are obtained from a recursive estimation of the model.The graph (figure 3 and 4) below depicts the results for CUSUM and (CUSUMSQ) test. The results indicate stability in the coefficients of the model, because the plots of the CUSUM statistic fall inside the critical bounds of 5% confidence interval of parameter stability.

Figure 3: CUSUM

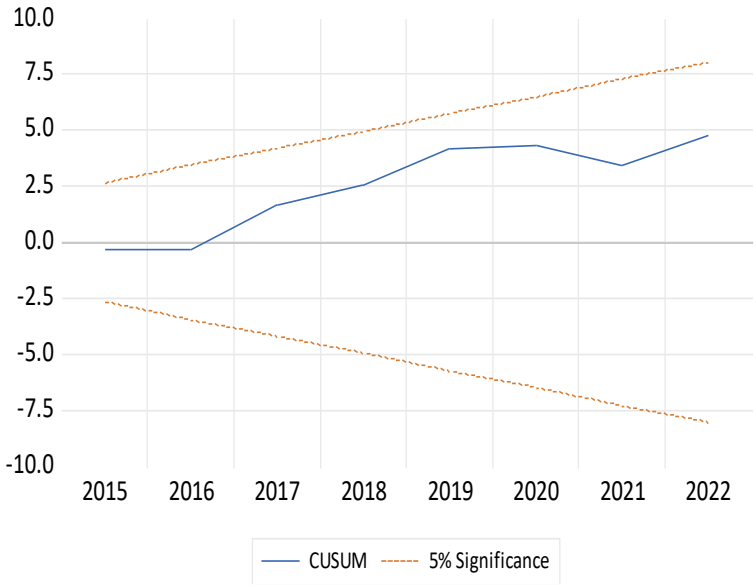
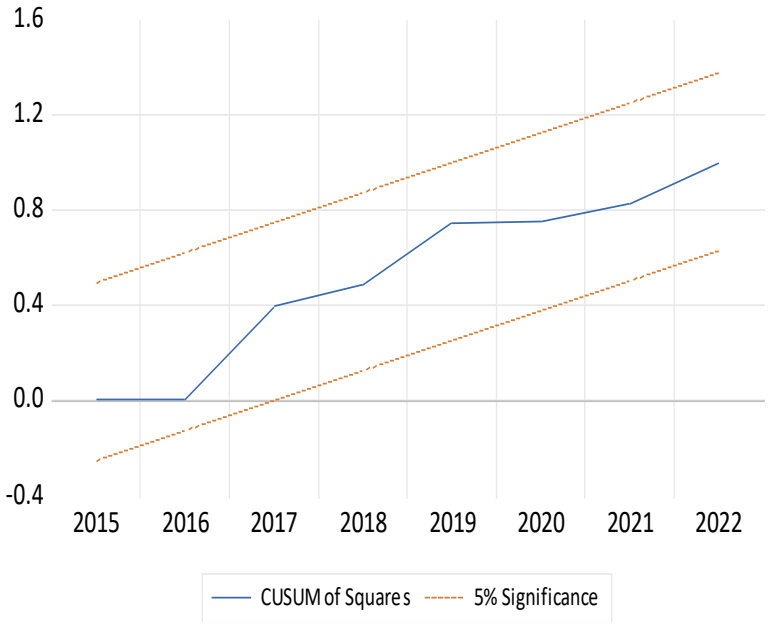


Figure 4: CUSUM of Squares



Model 2 on financial stability and economic development

Table 6 ARDL Bond Test Result for Model 2

Model	F Statistics	5% Critical value		Decision
Equation 1	8.45	I(0)	I(1)	Co- integration
		2.56	3.49	

Source: Authors' computation using (EVIEWS 12)

The ARDL bounds test is based on the assumption that the variables are I (0) or I (1) as shown above in the unit root table. The results of the ARDL bounds testing approach are presented in table (2) indicating that the computed F-statistics for explanatory variables was (8.45). The f- bound test statistics of (8.45) exceeds upper critical bound (3.49) at 5% level of significance. This finding supports that co-integrating relationship exists and confirms the stable long-run relationship between the variables. This implies that the null hypothesis of no co-integration among the variables is rejected.

Table 7: ARDL Error Correction (ECM) Regression for Model 2

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CPS)	1.981879	1.634461	1.212559	0.2429
D(CPS(-1))	1.693789	1.643231	1.030768	0.3180
D(CPS(-2))	8.827085	1.732280	5.095646	0.0001
D(NIM)	1750.944	1058.148	1.654725	0.1175
D(NIM(-1))	1620.342	1048.998	1.544657	0.1420
D(NIM(-2))	1868.678	955.1470	1.956430	0.0681
D(NIM(-3))	3251.939	951.8353	3.416493	0.0035
D(EXRATE)	-144.4619	64.46935	-2.240785	0.0396
D(EXRATE(-1))	-226.8476	76.31885	-2.972366	0.0090
D(EXRATE(-2))	-143.2131	82.75474	-1.730573	0.1028
D(INF)	-128.4055	117.2323	-1.095308	0.2896
CointEq(-1)*	-0.081407	0.009982	-8.155407	0.0000

R-squared	0.999373	Mean dependent var	286690.9
Adjusted R-squared	0.998746	S.D. dependent var	277200.5
S.E. of regression	9814.671	Akaike info criterion	21.52753
Sum squared resid	1.54E+09	Schwarz criterion	22.29846
Log likelihood	-338.2042	Hannan-Quinn criter.	21.78692
F-statistic	1594.389	Durbin-Watson stat	2.206306
Prob(F-statistic)	0.000000		

The result showed that R^2 (R-Squared) value of 0.999 was obtained. This implies that 99% of the variations in economic development is explained by changes financial stability variables. The F-Statistics of 1594.389 is significant considering the probability value. This implies that the model has goodness of fit. The Durbin-Watson value of 2.20 which is approximately 2 indicates that there exists no serial correlation. The error correction model (ECM) for economic development and financial stability is specified, following the Representation Theorem specified. The primary reason for this is to capture the dynamics in economic development and financial stability in the short-run and identify the speed of adjustment as a response to departures from the long-run equilibrium. Thus, the general specification framework of the ECM is shown in Table 7.

Statistically, the ECM term is negative and significant at 5% probability level. The existence of short run equilibrium among the time series in government expenditure on agriculture equation is validated by this result. The slope coefficient of the error term in absolute terms (8.14) represents the speed of adjustment and is consistent with the hypothesis of convergence towards the long-run equilibrium once economic development equation fluctuates from its equilibrium in the short run. The coefficient of the ECMt-1 suggests that economic development adjusts to the explanatory time series as about 8.1 percent of the discrepancy between long-run and short-run is corrected annually in the country.

In the short run, the coefficient of credit to private sector (1.98), (1.69), (8.82) at current level, lag 1 and lag 2 respectively. The result indicates that CPS (credit to the private sector) is positive but statistically insignificant in the current period and lagged one period to GDP, while lagged two periods is positive and statistically significant to GDP, it suggests a delayed impact of changes in credit to the private sector on GDP. The positive coefficient for CPS in the current period indicates that an increase in credit to the private sector is associated with an increase in GDP, but this relationship is not statistically significant. However, the positive and significant coefficient for CPS lagged two periods suggests that changes in credit to the private sector two periods ago have a significant positive impact on current GDP. Policymakers may need to consider the timing and magnitude of monetary policy interventions, such as interest rate adjustments or liquidity injections, in response to changes in credit to the private sector. While current changes in credit may not have an immediate impact on GDP, the significant lagged effect suggests that policy responses may need to be implemented with a delay.

The NIM (Net Interest Margin) is positive but statistically insignificant in the current period and lagged one period to GDP, while lagged three periods is positive and statistically significant to GDP, it suggests a delayed impact of changes in net interest margin on GDP. The positive coefficient for NIM in the current period

indicates that an increase in net interest margin is associated with an increase in GDP, but this relationship is not statistically significant. However, the positive and significant coefficient for NIM lagged three periods suggests that changes in net interest margin three periods ago have a significant positive impact on current GDP. The policy response would involve a nuanced approach that considers both the immediate and delayed effects of changes in net interest margin on GDP, ensuring that policy interventions are timely and effective in supporting overall economic stability and growth.

The coefficient of exchange rate is negative and statistically significant in the current period and lagged one period to GDP, it suggests an immediate impact of changes in the exchange rate on GDP. The negative coefficient for the exchange rate in the current period indicates that a depreciation of the domestic currency (increase in the exchange rate) is associated with a decrease in GDP, and this relationship is statistically significant. This implies that a sudden depreciation of the domestic currency may negatively affect economic output in the short run.

The negative coefficient for inflation in the current period indicates that a decrease in inflation (or deflation) is associated with a decrease in GDP, but this relationship is not statistically significant. This implies that changes in inflation levels are not having a statistically significant effect on economic output in the short run.

Table 8: Long run ARDL

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-23460.67	15303.09	-1.533068	0.1448
GDP(-1)*	-0.081407	0.081695	-0.996483	0.3338
CPS(-1)	-0.070579	1.846356	-0.038226	0.9700
NIM(-1)	2369.317	2007.776	1.180070	0.2552
EXRATE(-1)	344.5306	70.28809	4.901693	0.0002
INF(-1)	43.79755	148.6213	0.294692	0.7720
D(CPS)	1.981879	2.195619	0.902652	0.3801
D(CPS(-1))	1.693789	2.215558	0.764498	0.4557
D(CPS(-2))	8.827085	2.203769	4.005450	0.0010
D(NIM)	1750.944	1450.578	1.207067	0.2449
D(NIM(-1))	1620.342	1540.099	1.052102	0.3084
D(NIM(-2))	1868.678	1214.529	1.538603	0.1434
D(NIM(-3))	3251.939	1278.392	2.543772	0.0217
D(EXRATE)	-144.4619	88.11796	-1.639415	0.1206
D(EXRATE(-1))	-226.8476	114.8336	-1.975446	0.0657
D(EXRATE(-2))	-143.2131	109.5560	-1.307213	0.2096
D(INF)	-128.4055	152.0139	-0.844696	0.4107

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPS	-0.866980	23.48368	-0.036918	0.9710
NIM	29104.47	28443.15	1.023251	0.3214
EXRATE	4232.181	3927.166	1.077668	0.2972
INF	538.0049	2127.282	0.252907	0.8036
C	-288188.7	325450.4	-0.885507	0.3890

EC = GDP - (-0.8670*CPS + 29104.4684*NIM + 4232.1810*EXRATE + 538.0049*INF - 288188.6825)

The result presented in Table 8 (Conditional Error Correction Long-run Regression result for economic development) indicates that in the long run, a year lag of (EXRATE) is positive and significant at 5% level to GDP. It implies that, a postive exchange rate could attract foreign investment, which could contributes to economic development.

The coefficient of Credit to private sector (CPS) at lag 2 is positive and significant to GDP in the long run. It implies that, an increase in CPS is associated with a positive effect on GDP in the current period. That is, increased credit to the private can stimulate investment and consumption, leading to higher economic activity and development

Net interest margin (NIM) indicates a positive and significant relationship with GDP, which implies that, as the economy grows, there is an associated increase in NIM. This indicates that financial institutions are effectively managing their interest rate spread, which can lead to higher profits

While, (case 2 restricted constant and no trend) shows that in the long-run CPS is negative to GDP, Net interest margin (NIM), EXRATE, INF is all positive. The variables are not insignificant in the long-run. This implies that, an increase in credit extended to the private sector does not significantly contribute to long-term

economic development. Positive but insignificant relationship for NIM, Exchange rate and inflation, suggests that changes in these factors do not have a significant long-term impact on GDP. These findings align with the integrated financial liberalization theory, which argues that weak financial development, such as that observed in Nigeria results in inefficient credit allocation and consequently negative or insignificant economic outcomes (Rodrik, 1998; Chang, 2002)

Diagnostic Tests

The Diagnostic tests for serial correlation, Heteroskedasticity and normality were conducted, and the results are presented in Table 5. The result for serial correlation shows that errors in equation are not serially correlated. The test for Heteroskedasticity indicated that there were equal spreads in variance in the equations of the model with a probability value of 0.6016. The normality test of the equation in the model shows that the equation allows the normal distribution. The Jarque – Bera statistics of 1.089032 with the probability values of 0.580123 shows that the variables in the model are normally distributed.

Table 9: Diagnostic Tests for Model II

Test	R^2 Statistics	Probability Value
Breusch-Godfrey LM test for Serial correlation	0.965232	0.6172
White Heteroskedasticity	13.96071	0.6016
Normality Test	1.089032	0.580123

Stability Test

It is ideal to investigate the stability of ARDL model. For this purpose, we have checked the stability of the model parameters using both cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) test procedures. CUSUM and (CUSUMSQ) are plotted against the break points. The plot of the CUSUM and (CUSUMSQ) are obtained from a recursive estimation of the model.

The graph (figure 5 and 6) below depicts the results for CUSUM and (CUSUMSQ) test. The results indicate stability in the coefficients of the model, because the plots of the CUSUM statistic fall inside the critical bounds of 5% confidence interval of parameter stability.

Figure 5

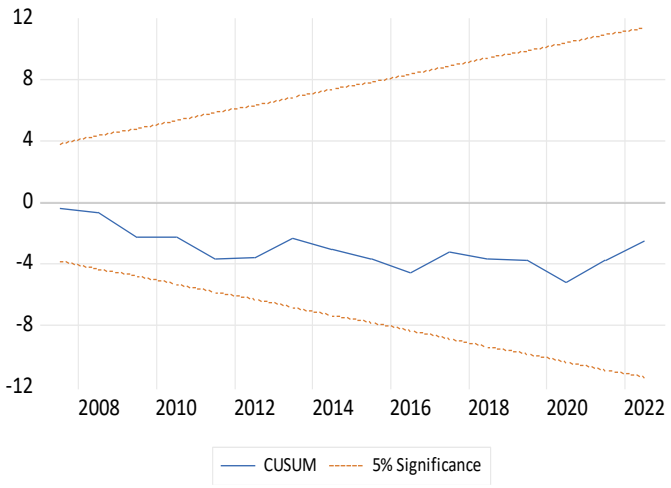


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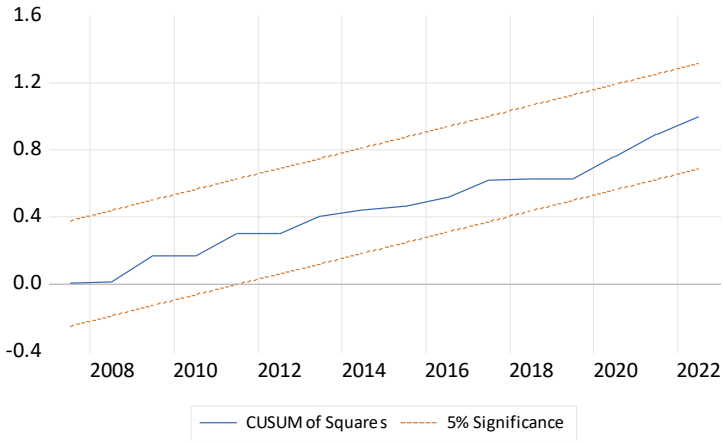
Figure 6



SUMMARY, CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to examine impact of capital outflow and financial sector stability on economic development in Nigeria by using data extending over a period of 1986 to 2022. The unit root test was conducted to ascertain the stationarity of the variables' the ARDL Error Correction regression analysis was used to test the short run relationship capital outflow and financial sector stability on economic development. The ARDL long run analysis was used to ascertain the long-run relationship among the variables. This study has shown that the variables for the model were normally distributed.

The result from the capital outflow variables showed that both net port-folio investment and net direct investment indicated a negative but significant relationship with GDP, this negative relationship highlights potential challenges in leveraging foreign capital to drive sustained economic development. It suggests that simply increasing foreign investment inflows may not guarantee positive economic outcomes.

For financial sector stability it was discovered that, in the long-run CPS is negative to GDP, Net interest margin (NIM), EXRATE, INF are all positive but all the variables are not insignificant in the long-run. This calls for the need to reassess the effectiveness of credit allocation policies to ensure that credit expansion to the private sector aligns with long-term economic development objectives. Also, given the insignificant effect of the variables others factors such as investment, innovation, and productivity should be considered to stimulate economic development. The result conform from the integrated financial liberalization and financial repression theory financial markets may become more prone to speculative excesses, leading to boom-bust cycles and financial crises and undermining the objective of economic development in the economy.

To situate Nigeria's experience within broader global patterns, comparative evidence from emerging economies reveals mixed outcomes. In South Africa, capital flows have been volatile due to heavy commodity dependence similar to Nigeria's reliance on oil which has contributed to periodic outflows and growth slowdowns (Brooks, 2025; ISS, 2025). Although both countries face commodity-induced volatility, South Africa's relatively stronger institutional framework mitigates some risks, whereas Nigeria's weaker governance structures exacerbate capital flight (Muhammad et al., 2023). In Brazil, episodes of large capital inflows have led to currency appreciation and symptoms of "Dutch disease," negatively affecting manufacturing productivity, a challenge that mirrors Nigeria's non-oil sector struggles (Prasad et al., 2006). India presents a contrasting case, where robust financial development and higher absorptive capacity have enabled FDI to stimulate manufacturing and overall growth (End, 2024; ScienceDirect, 2024). In Kenya, while remittances and FDI support growth, evidence shows that aid generates negative long-run effects, reflecting broader patterns observed across Sub-Saharan Africa, including Nigeria (Taylor and Francis, 2025; ISS, 2025). Overall, Nigeria's negative capital-flow effects are consistent with outcomes in other commodity-dependent economies but are intensified by institutional weaknesses, underscoring the urgency of reforms that emulate the successes observed in more financially developed economies such as India.

RECOMMENDATION

From the findings of this study, the following recommendations are given;

1. Give the significant effect of capital flow, policymakers should aim to strike a balance between attracting foreign investment and ensuring that it aligns with broader economic development goals. This may involve fostering a conducive investment environment, enhancing regulatory frameworks, and promoting domestic capacity-building initiatives.
2. There should be implementation of targeted policies to improve credit allocation efficiency, ensuring that credit is directed towards productive sectors that contribute to economic development.

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Appendix

Gdp At First Difference

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.158658	0.0123
Test critical values:	1% level	-4.243644	
	5% level	-3.544284	
	10% level	-3.204699	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 02/19/24 Time: 21:36
Sample (adjusted): 1988 2022
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-0.835498	0.200906	-4.158658	0.0002
C	-10499.45	5729.447	-1.832542	0.0762
@TREND("1986")	1737.344	435.0075	3.993825	0.0004

R-squared	0.364146	Mean dependent var	2869.145
Adjusted R-squared	0.324406	S.D. dependent var	18059.16
S.E. of regression	14843.64	Akaike info criterion	22.13035
Sum squared resid	7.05E+09	Schwarz criterion	22.26366
Log likelihood	-384.2811	Hannan-Quinn criter.	22.17637
F-statistic	9.163027	Durbin-Watson stat	1.820292
Prob(F-statistic)	0.000714		

Cps At First Difference

Null Hypothesis: D(CPS) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.912883	0.0220
Test critical values:	1% level	-4.243644	
	5% level	-3.544284	
	10% level	-3.204699	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CPS,2)
Method: Least Squares
Date: 02/19/24 Time: 21:39
Sample (adjusted): 1988 2022
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CPS(-1))	-0.782216	0.199908	-3.912883	0.0004
C	-811.4460	437.6133	-1.854253	0.0729
@TREND("1986")	90.49926	26.21056	3.452778	0.0016

R-squared	0.338943	Mean dependent var	174.3123
Adjusted R-squared	0.297627	S.D. dependent var	1355.651
S.E. of regression	1136.140	Akaike info criterion	16.99048
Sum squared resid	41306030	Schwarz criterion	17.12379
Log likelihood	-294.3333	Hannan-Quinn criter.	17.03650
F-statistic	8.203668	Durbin-Watson stat	1.814420
Prob(F-statistic)	0.001330		

Nim At Level

Null Hypothesis: NIM has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.550393	0.0489
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NIM)
Method: Least Squares
Date: 02/19/24 Time: 21:41
Sample (adjusted): 1987 2022
Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NIM(-1)	-0.481761	0.135692	-3.550393	0.0012
C	3.210213	0.878702	3.653358	0.0009
@TREND("1986")	0.017962	0.029478	0.609346	0.5465

R-squared	0.301512	Mean dependent var	0.156862
Adjusted R-squared	0.259180	S.D. dependent var	1.864813
S.E. of regression	1.605062	Akaike info criterion	3.863857
Sum squared resid	85.01539	Schwarz criterion	3.995817
Log likelihood	-66.54943	Hannan-Quinn criter.	3.909915
F-statistic	7.122458	Durbin-Watson stat	1.928744
Prob(F-statistic)	0.002683		

Exchange Rate At First Difference

Null Hypothesis: D(EXRATE) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.281928	0.0007
Test critical values:	1% level	-4.243644	
	5% level	-3.544284	
	10% level	-3.204699	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXRATE,2)
Method: Least Squares
Date: 02/19/24 Time: 21:43
Sample (adjusted): 1988 2022
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXRATE(-1))	-0.931423	0.176341	-5.281928	0.0000
C	-4.188371	8.954916	-0.467717	0.6432
@TREND("1986")	0.861350	0.444780	1.936577	0.0617

R-squared	0.465766	Mean dependent var	0.689286
Adjusted R-squared	0.432376	S.D. dependent var	32.83213
S.E. of regression	24.73600	Akaike info criterion	9.336213
Sum squared resid	19579.83	Schwarz criterion	9.469528
Log likelihood	-160.3837	Hannan-Quinn criter.	9.382233
F-statistic	13.94940	Durbin-Watson stat	1.972680
Prob(F-statistic)	0.000044		

Inflation At First Difference

Null Hypothesis: D(INF) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.604783	0.0003
Test critical values:	1% level	-4.243644	
	5% level	-3.544284	
	10% level	-3.204699	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF,2)
Method: Least Squares
Date: 02/19/24 Time: 21:47
Sample (adjusted): 1988 2022
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-0.991603	0.176921	-5.604783	0.0000
C	1.171382	6.057646	0.193372	0.8479
@TREND("1986")	-0.044159	0.281541	-0.156847	0.8764

R-squared	0.495381	Mean dependent var	0.277057
Adjusted R-squared	0.463842	S.D. dependent var	22.96175
S.E. of regression	16.81324	Akaike info criterion	8.564027
Sum squared resid	9045.920	Schwarz criterion	8.697342
Log likelihood	-146.8705	Hannan-Quinn criter.	8.610047
F-statistic	15.70708	Durbin-Watson stat	1.650674
Prob(F-statistic)	0.000018		

Npi At First Difference

Null Hypothesis: D(NPI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.439144	0.0000
Test critical values:	1% level	-4.243644	
	5% level	-3.544284	
	10% level	-3.204699	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NPI,2)
Method: Least Squares
Date: 02/19/24 Time: 22:19
Sample (adjusted): 1988 2022
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NPI(-1))	-1.129526	0.175416	-6.439144	0.0000
C	-2029.612	50743.86	-0.039997	0.9683
@TREND("1986")	-402.6020	2359.980	-0.170596	0.8656

R-squared	0.564438	Mean dependent var	303.0543
Adjusted R-squared	0.537215	S.D. dependent var	207126.3
S.E. of regression	140904.5	Akaike info criterion	26.63137
Sum squared resid	6.35E+11	Schwarz criterion	26.76468
Log likelihood	-463.0490	Hannan-Quinn criter.	26.67739
F-statistic	20.73414	Durbin-Watson stat	2.053330
Prob(F-statistic)	0.000002		

Ndi At First Difference

Null Hypothesis: D(NDI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.296517	0.0095
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NDI,2)
Method: Least Squares
Date: 02/19/24 Time: 22:21
Sample (adjusted): 1991 2022
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NDI(-1))	-2.587230	0.602169	-4.296517	0.0002
D(NDI(-1),2)	1.413903	0.575128	2.458415	0.0209
D(NDI(-2),2)	0.509508	0.493147	1.033175	0.3110
D(NDI(-3),2)	0.874659	0.346340	2.525434	0.0180
C	36930.86	62149.82	0.594223	0.5575
@TREND("1986")	-2876.496	2894.895	-0.993644	0.3296

R-squared	0.690894	Mean dependent var	24415.01
Adjusted R-squared	0.631450	S.D. dependent var	230069.5
S.E. of regression	139671.2	Akaike info criterion	26.69933
Sum squared resid	5.07E+11	Schwarz criterion	26.97416
Log likelihood	-421.1893	Hannan-Quinn criter.	26.79043
F-statistic	11.62270	Durbin-Watson stat	2.015559
Prob(F-statistic)	0.000006		

Model One

Ardl Estimation

Dependent Variable: GDP
Method: ARDL
Date: 02/19/24 Time: 21:49
Sample (adjusted): 1990 2022
Included observations: 33 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): CPS NIM EXRATE INF
Fixed regressors: C
Number of models evaluated: 2500
Selected Model: ARDL(1, 3, 4, 3, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	0.918593	0.081695	11.24421	0.0000
CPS	1.981879	2.195619	0.902652	0.3801
CPS(-1)	-0.358669	3.321665	-0.107979	0.9154
CPS(-2)	7.133296	2.928201	2.436067	0.0269
CPS(-3)	-8.827085	2.203769	-4.005450	0.0010
NIM	1750.944	1450.578	1.207067	0.2449
NIM(-1)	2238.716	1584.281	1.413080	0.1768
NIM(-2)	248.3360	1640.993	0.151333	0.8816
NIM(-3)	1383.260	1473.421	0.938809	0.3618
NIM(-4)	-3251.939	1278.392	-2.543772	0.0217
EXRATE	-144.4619	88.11796	-1.639415	0.1206
EXRATE(-1)	262.1450	112.4859	2.330470	0.0332
EXRATE(-2)	83.63447	118.5889	0.705247	0.4908
EXRATE(-3)	143.2131	109.5560	1.307213	0.2096
INF	-128.4055	152.0139	-0.844696	0.4107
INF(-1)	172.2031	160.9333	1.070028	0.3005
C	-23460.67	15303.09	-1.533068	0.1448

R-squared	0.999373	Mean dependent var	286690.9
Adjusted R-squared	0.998746	S.D. dependent var	277200.5
S.E. of regression	9814.671	Akaike info criterion	21.52753
Sum squared resid	1.54E+09	Schwarz criterion	22.29846
Log likelihood	-338.2042	Hannan-Quinn criter.	21.78692
F-statistic	1594.389	Durbin-Watson stat	2.206306
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Long-Run Estimation

ARDL Long Run Form and Bounds Test
Dependent Variable: D(GDP)
Selected Model: ARDL(1, 3, 4, 3, 1)
Case 2: Restricted Constant and No Trend
Date: 02/19/24 Time: 21:50
Sample: 1986 2022
Included observations: 33

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-23460.67	15303.09	-1.533068	0.1448
GDP(-1)*	-0.081407	0.081695	-0.996483	0.3338
CPS(-1)	-0.070579	1.846356	-0.038226	0.9700
NIM(-1)	2369.317	2007.776	1.180070	0.2552
EXRATE(-1)	344.5306	70.28809	4.901693	0.0002
INF(-1)	43.79755	148.6213	0.294692	0.7720
D(CPS)	1.981879	2.195619	0.902652	0.3801
D(CPS(-1))	1.693789	2.215558	0.764498	0.4557
D(CPS(-2))	8.827085	2.203769	4.005450	0.0010
D(NIM)	1750.944	1450.578	1.207067	0.2449
D(NIM(-1))	1620.342	1540.099	1.052102	0.3084
D(NIM(-2))	1868.678	1214.529	1.538603	0.1434
D(NIM(-3))	3251.939	1278.392	2.543772	0.0217
D(EXRATE)	-144.4619	88.11796	-1.639415	0.1206
D(EXRATE(-1))	-226.8476	114.8336	-1.975446	0.0657
D(EXRATE(-2))	-143.2131	109.5560	-1.307213	0.2096
D(INF)	-128.4055	152.0139	-0.844696	0.4107

* p-value incompatible with t-Bounds distribution.

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPS	-0.866980	23.48368	-0.036918	0.9710
NIM	29104.47	28443.15	1.023251	0.3214
EXRATE	4232.181	3927.166	1.077668	0.2972
INF	538.0049	2127.282	0.252907	0.8036
C	-288188.7	325450.4	-0.885507	0.3890

EC = GDP - (-0.8670*CPS + 29104.4684*NIM + 4232.1810*EXRATE +
538.0049*INF - 288188.6825)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	8.445798	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Actual Sample Size	33		Finite Sample: n=35	
		10%	2.46	3.46
		5%	2.947	4.088
		1%	4.093	5.532
			Finite Sample: n=30	
		10%	2.525	3.56
		5%	3.058	4.223
		1%	4.28	5.84

Short-Run

ARDL Error Correction Regression
Dependent Variable: D(GDP)
Selected Model: ARDL(1, 3, 4, 3, 1)
Case 2: Restricted Constant and No Trend
Date: 02/19/24 Time: 21:54
Sample: 1986 2022
Included observations: 33

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CPS)	1.981879	1.634461	1.212559	0.2429
D(CPS(-1))	1.693789	1.643231	1.030768	0.3180
D(CPS(-2))	8.827085	1.732280	5.095646	0.0001
D(NIM)	1750.944	1058.148	1.654725	0.1175
D(NIM(-1))	1620.342	1048.998	1.544657	0.1420
D(NIM(-2))	1868.678	955.1470	1.956430	0.0681
D(NIM(-3))	3251.939	951.8353	3.416493	0.0035
D(EXRATE)	-144.4619	64.46935	-2.240785	0.0396
D(EXRATE(-1))	-226.8476	76.31885	-2.972366	0.0090
D(EXRATE(-2))	-143.2131	82.75474	-1.730573	0.1028
D(INF)	-128.4055	117.2323	-1.095308	0.2896
CointEq(-1)*	-0.081407	0.009982	-8.155407	0.0000

R-squared	0.924903	Mean dependent var	27924.48
Adjusted R-squared	0.885567	S.D. dependent var	25325.06
S.E. of regression	8566.947	Akaike info criterion	21.22450
Sum squared resid	1.54E+09	Schwarz criterion	21.76868
Log likelihood	-338.2042	Hannan-Quinn criter.	21.40760
Durbin-Watson stat	2.206306		

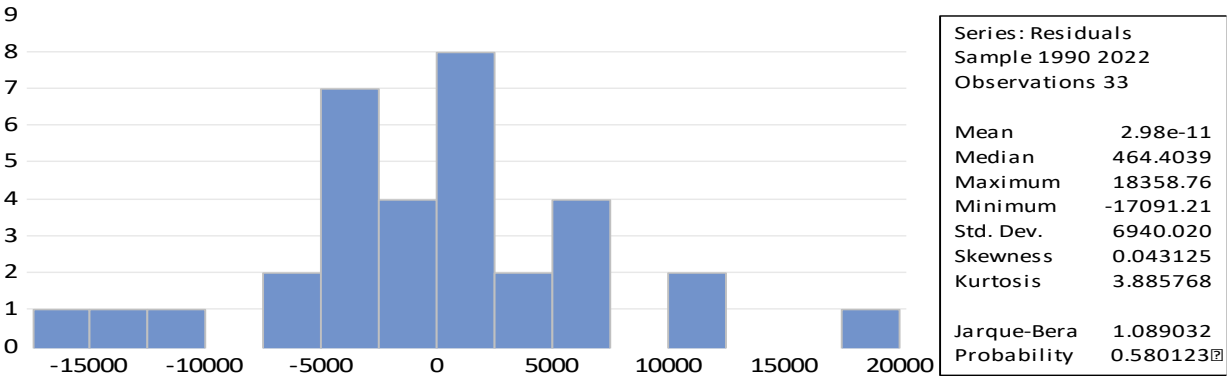
* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	8.445798	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Diagnostic Test

Normality Test



Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.210915	Prob. F(2,14)	0.8124
Obs*R-squared	0.965232	Prob. Chi-Square(2)	0.6172

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 02/19/24 Time: 22:00
Sample: 1990 2022
Included observations: 33
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.035772	0.109602	0.326380	0.7490
CPS	0.133602	2.358817	0.056639	0.9556
CPS(-1)	-1.080129	4.015305	-0.269003	0.7919
CPS(-2)	-0.014843	3.146448	-0.004717	0.9963
CPS(-3)	0.248959	2.406420	0.103456	0.9191
NIM	147.2193	1622.258	0.090750	0.9290
NIM(-1)	-203.8012	1770.898	-0.115084	0.9100
NIM(-2)	-69.25086	1823.082	-0.037986	0.9702
NIM(-3)	-155.4094	1575.950	-0.098613	0.9228
NIM(-4)	137.5406	1370.731	0.100341	0.9215
EXRATE	-4.663424	93.18696	-0.050044	0.9608
EXRATE(-1)	20.78308	122.7730	0.169281	0.8680
EXRATE(-2)	-9.818513	126.2237	-0.077787	0.9391
EXRATE(-3)	-28.22559	131.9002	-0.213992	0.8336
INF	22.54808	163.8384	0.137624	0.8925
INF(-1)	7.941692	172.0326	0.046164	0.9638
C	-406.7319	16175.91	-0.025144	0.9803
RESID(-1)	-0.226622	0.352190	-0.643467	0.5303
RESID(-2)	-0.071489	0.380302	-0.187981	0.8536

R-squared	0.029249	Mean dependent var	2.98E-11
Adjusted R-squared	-1.218858	S.D. dependent var	6940.020
S.E. of regression	10337.74	Akaike info criterion	21.61905
Sum squared resid	1.50E+09	Schwarz criterion	22.48068
Log likelihood	-337.7144	Hannan-Quinn criter.	21.90897
F-statistic	0.023435	Durbin-Watson stat	1.970595
Prob(F-statistic)	1.000000		

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.733258	Prob. F(16,16)	0.7290
Obs*R-squared	13.96071	Prob. Chi-Square(16)	0.6016
Scaled explained SS	4.735339	Prob. Chi-Square(16)	0.9969

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/19/24 Time: 22:01
Sample: 1990 2022
Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	20532092	1.35E+08	0.152151	0.8810
GDP(-1)	-140.1865	720.3966	-0.194596	0.8482
CPS	-19071.99	19361.31	-0.985057	0.3393
CPS(-1)	34443.30	29290.96	1.175902	0.2568
CPS(-2)	-36655.33	25821.34	-1.419575	0.1749
CPS(-3)	12921.17	19433.18	0.664903	0.5156
NIM	-5022902.	12791421	-0.392677	0.6997
NIM(-1)	7375683.	13970439	0.527949	0.6048
NIM(-2)	-5295296.	14470535	-0.365936	0.7192
NIM(-3)	4005418.	12992856	0.308279	0.7618
NIM(-4)	-4915923.	11273063	-0.436077	0.6686
EXRATE	928236.4	777037.9	1.194583	0.2497
EXRATE(-1)	-916080.3	991918.2	-0.923544	0.3694
EXRATE(-2)	289212.8	1045736.	0.276564	0.7857
EXRATE(-3)	1039984.	966082.1	1.076496	0.2977
INF	160030.5	1340482.	0.119383	0.9065
INF(-1)	-244838.0	1419135.	-0.172526	0.8652

R-squared	0.423052	Mean dependent var	46704369
Adjusted R-squared	-0.153896	S.D. dependent var	80569406
S.E. of regression	86547299	Akaike info criterion	39.69666
Sum squared resid	1.20E+17	Schwarz criterion	40.46759
Log likelihood	-637.9950	Hannan-Quinn criter.	39.95606
F-statistic	0.733258	Durbin-Watson stat	2.865449
Prob(F-statistic)	0.728970		

Model Two

Dependent Variable: GDP
Method: ARDL
Date: 02/19/24 Time: 22:25
Sample (adjusted): 1990 2022
Included observations: 33 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): NPI NDI EXRATE INF
Fixed regressors: C
Number of models evaluated: 2500
Selected Model: ARDL(4, 4, 4, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	0.738601	0.167725	4.403655	0.0023
GDP(-2)	-0.140919	0.239719	-0.587850	0.5728
GDP(-3)	-0.687098	0.253694	-2.708374	0.0267
GDP(-4)	0.841945	0.203732	4.132613	0.0033
NPI	-0.091612	0.016445	-5.570888	0.0005
NPI(-1)	0.019112	0.012792	1.494001	0.1735
NPI(-2)	-0.038835	0.014579	-2.663772	0.0286
NPI(-3)	-0.011469	0.013921	-0.823833	0.4339
NPI(-4)	-0.021692	0.016908	-1.282953	0.2354
NDI	-0.016124	0.013569	-1.188256	0.2688
NDI(-1)	-0.065703	0.014406	-4.560648	0.0018
NDI(-2)	-0.008778	0.024003	-0.365698	0.7241
NDI(-3)	0.094093	0.028545	3.296365	0.0109
NDI(-4)	-0.133823	0.026929	-4.969475	0.0011
EXRATE	55.55277	83.35716	0.666443	0.5239
EXRATE(-1)	333.6332	81.61596	4.087843	0.0035
EXRATE(-2)	2.610986	77.69473	0.033606	0.9740
EXRATE(-3)	175.6222	76.34111	2.300492	0.0504
EXRATE(-4)	155.0810	81.89616	1.893629	0.0949
INF	-199.0215	102.1823	-1.947710	0.0873
INF(-1)	280.7106	130.8533	2.145231	0.0643
INF(-2)	-167.9634	134.3069	-1.250594	0.2464
INF(-3)	197.3047	110.1508	1.791223	0.1110
INF(-4)	76.76570	92.98453	0.825575	0.4330
C	-3260.083	7382.140	-0.441618	0.6705

R-squared	0.999920	Mean dependent var	286690.9
Adjusted R-squared	0.999682	S.D. dependent var	277200.5
S.E. of regression	4945.404	Akaike info criterion	19.94839
Sum squared resid	1.96E+08	Schwarz criterion	21.08211
Log likelihood	-304.1484	Hannan-Quinn criter.	20.32985
F-statistic	4188.791	Durbin-Watson stat	2.063749
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Long-Run

ARDL Long Run Form and Bounds Test
Dependent Variable: D(GDP)
Seleeted Model: ARDL(4, 4, 4, 4, 4)
Case 2: Restricted Constant and No Trend
Date: 02/19/24 Time: 22:27
Sample: 1986 2022
Included observations: 33

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3260.083	7382.140	-0.441618	0.6705
GDP(-1)*	-0.247472	0.056334	-4.392927	0.0023
NPI(-1)	-0.144496	0.025544	-5.656854	0.0005
NDI(-1)	-0.130334	0.035110	-3.712118	0.0059
EXRATE(-1)	722.5001	104.9756	6.882553	0.0001
INF(-1)	187.7960	169.7986	1.105993	0.3009
D(GDP(-1))	-0.013927	0.179890	-0.077420	0.9402
D(GDP(-2))	-0.154846	0.187353	-0.826496	0.4325
D(GDP(-3))	-0.841945	0.203732	-4.132613	0.0033
D(NPI)	-0.091612	0.016445	-5.570888	0.0005
D(NPI(-1))	0.071996	0.015816	4.551987	0.0019
D(NPI(-2))	0.033161	0.017758	1.867358	0.0988
D(NPI(-3))	0.021692	0.016908	1.282953	0.2354
D(NDI)	-0.016124	0.013569	-1.188256	0.2688
D(NDI(-1))	0.048507	0.033001	1.469858	0.1798
D(NDI(-2))	0.039730	0.027972	1.420349	0.1933
D(NDI(-3))	0.133823	0.026929	4.969475	0.0011
D(EXRATE)	55.55277	83.35716	0.666443	0.5239
D(EXRATE(-1))	-333.3141	105.1907	-3.168664	0.0132
D(EXRATE(-2))	-330.7031	92.74182	-3.565847	0.0073
D(EXRATE(-3))	-155.0810	81.89616	-1.893629	0.0949
D(INF)	-199.0215	102.1823	-1.947710	0.0873
D(INF(-1))	-106.1070	152.2080	-0.697118	0.5055
D(INF(-2))	-274.0704	102.4690	-2.674667	0.0282
D(INF(-3))	-76.76570	92.98453	-0.825575	0.4330

* p-value incompatible with t-Bounds distribution.

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPI	-0.583889	0.113563	-5.141523	0.0009
NDI	-0.526661	0.078476	-6.711075	0.0002
EXRATE	2919.527	373.7459	7.811528	0.0001
INF	758.8588	621.2102	1.221581	0.2566
C	-13173.56	28489.17	-0.462406	0.6561

EC = GDP - (-0.5839*NPI -0.5267*NDI + 2919.5267*EXRATE + 758.8588*INF
- 13173.5618)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	10.70927	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Actual Sample Size	33	Finite Sample: n=35		
		10%	2.46	3.46
		5%	2.947	4.088
		1%	4.093	5.532
		Finite Sample: n=30		
		10%	2.525	3.56
		5%	3.058	4.223
		1%	4.28	5.84

Error Correction

ARDL Error Correction Regression
Dependent Variable: D(GDP)
Selected Model: ARDL(4, 4, 4, 4, 4)
Case 2: Restricted Constant and No Trend
Date: 02/19/24 Time: 22:29
Sample: 1986 2022
Included observations: 33

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-0.013927	0.102822	-0.135448	0.8956
D(GDP(-2))	-0.154846	0.125238	-1.236412	0.2514
D(GDP(-3))	-0.841945	0.127750	-6.590578	0.0002
D(NPI)	-0.091612	0.010196	-8.985434	0.0000
D(NPI(-1))	0.071996	0.008726	8.251156	0.0000
D(NPI(-2))	0.033161	0.009821	3.376459	0.0097
D(NPI(-3))	0.021692	0.009744	2.226172	0.0566
D(NDI)	-0.016124	0.008013	-2.012099	0.0790
D(NDI(-1))	0.048507	0.015141	3.203804	0.0125
D(NDI(-2))	0.039730	0.014266	2.785007	0.0237
D(NDI(-3))	0.133823	0.017127	7.813651	0.0001
D(EXRATE)	55.55277	44.54259	1.247183	0.2476
D(EXRATE(-1))	-333.3141	69.30068	-4.809680	0.0013
D(EXRATE(-2))	-330.7031	61.57887	-5.370399	0.0007
D(EXRATE(-3))	-155.0810	51.42325	-3.015776	0.0167
D(INF)	-199.0215	62.28771	-3.195197	0.0127
D(INF(-1))	-106.1070	62.78011	-1.690137	0.1295
D(INF(-2))	-274.0704	58.78612	-4.662161	0.0016
D(INF(-3))	-76.76570	52.94694	-1.449861	0.1851
CointEq(-1)*	-0.247472	0.024218	-10.21838	0.0000

R-squared	0.990467	Mean dependent var	27924.48
Adjusted R-squared	0.976533	S.D. dependent var	25325.06
S.E. of regression	3879.494	Akaike info criterion	19.64536
Sum squared resid	1.96E+08	Schwarz criterion	20.55233
Log likelihood	-304.1484	Hannan-Quinn criter.	19.95053
Durbin-Watson stat	2.063749		

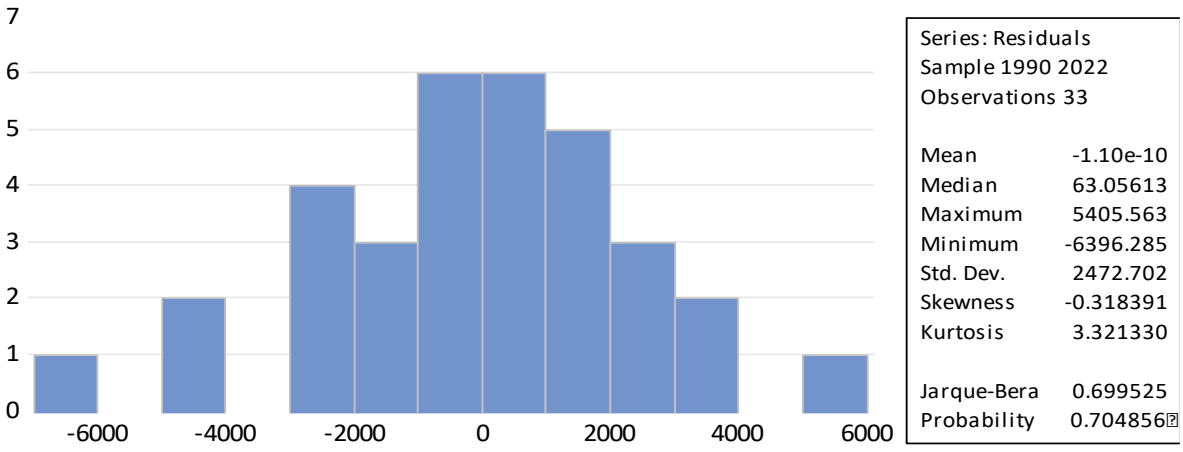
* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	10.70927	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Diagnostic Test

Normality Test



Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.189722	Prob. F(2,6)	0.8320
Obs*R-squared	1.962815	Prob. Chi-Square(2)	0.3748

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 02/19/24 Time: 22:31
Sample: 1990 2022
Included observations: 33
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.148161	0.306888	0.482786	0.6464
GDP(-2)	-0.107302	0.351806	-0.305003	0.7707
GDP(-3)	-0.158045	0.399995	-0.395118	0.7064
GDP(-4)	0.092765	0.274156	0.338366	0.7466
NPI	-0.004958	0.020671	-0.239879	0.8184
NPI(-1)	0.003100	0.015194	0.204041	0.8451
NPI(-2)	-0.007188	0.021148	-0.339877	0.7455
NPI(-3)	0.003537	0.017440	0.202781	0.8460
NPI(-4)	0.005753	0.021879	0.262958	0.8014
NDI	-0.004984	0.020715	-0.240585	0.8179
NDI(-1)	-0.007006	0.020011	-0.350131	0.7382
NDI(-2)	0.002192	0.027263	0.080404	0.9385
NDI(-3)	-0.001892	0.032650	-0.057953	0.9557
NDI(-4)	-0.008816	0.034167	-0.258032	0.8050
EXRATE	57.84407	136.5466	0.423622	0.6866
EXRATE(-1)	16.61317	95.37549	0.174187	0.8674
EXRATE(-2)	-41.00254	109.6440	-0.373961	0.7213
EXRATE(-3)	0.155850	86.05997	0.001811	0.9986
EXRATE(-4)	-40.35571	114.3949	-0.352776	0.7363
INF	-90.99118	187.7173	-0.484725	0.6451
INF(-1)	92.73509	210.1447	0.441292	0.6745
INF(-2)	-69.17627	187.7020	-0.368543	0.7251
INF(-3)	58.46489	158.1236	0.369742	0.7243
INF(-4)	-21.69310	109.9220	-0.197350	0.8501
C	549.3479	8499.888	0.064630	0.9506
RESID(-1)	-0.324641	0.718288	-0.451965	0.6672
RESID(-2)	-0.594424	1.015132	-0.585564	0.5795

R-squared	0.059479	Mean dependent var	-1.10E-10
Adjusted R-squared	-4.016111	S.D. dependent var	2472.702
S.E. of regression	5538.030	Akaike info criterion	20.00828
Sum squared resid	1.84E+08	Schwarz criterion	21.23270
Log likelihood	-303.1366	Hannan-Quinn criter.	20.42026
F-statistic	0.014594	Durbin-Watson stat	1.851818
Prob(F-statistic)	1.000000		

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.304531	Prob. F(24,8)	0.9887
Obs*R-squared	15.75495	Prob. Chi-Square(24)	0.8967
Scaled explained SS	1.074672	Prob. Chi-Square(24)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/19/24 Time: 22:32
Sample: 1990 2022
Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12237909	19797744	0.618147	0.5537
GDP(-1)	-179.3579	449.8111	-0.398740	0.7005
GDP(-2)	-130.4642	642.8888	-0.202934	0.8443
GDP(-3)	397.0561	680.3678	0.583590	0.5756
GDP(-4)	-99.08950	546.3767	-0.181357	0.8606
NPI	7.735366	44.10227	0.175396	0.8651
NPI(-1)	7.663117	34.30719	0.223368	0.8288
NPI(-2)	7.620063	39.09815	0.194896	0.8503
NPI(-3)	12.12668	37.33521	0.324805	0.7537
NPI(-4)	-35.70850	45.34481	-0.787488	0.4537
NDI	20.29341	36.39055	0.557656	0.5923
NDI(-1)	-0.287214	38.63571	-0.007434	0.9943
NDI(-2)	-1.331514	64.37194	-0.020685	0.9840
NDI(-3)	-5.653482	76.55210	-0.073851	0.9429
NDI(-4)	7.239605	72.21934	0.100245	0.9226
EXRATE	36330.13	223550.9	0.162514	0.8749
EXRATE(-1)	-214352.6	218881.2	-0.979310	0.3561
EXRATE(-2)	-6068.668	208365.1	-0.029125	0.9775
EXRATE(-3)	40955.87	204734.9	0.200043	0.8464
EXRATE(-4)	273325.1	219632.7	1.244464	0.2486
INF	217695.3	274037.0	0.794401	0.4499
INF(-1)	-113176.6	350928.2	-0.322506	0.7553
INF(-2)	-20147.56	360190.0	-0.055936	0.9568
INF(-3)	-47812.94	295407.3	-0.161854	0.8754
INF(-4)	-106612.5	249370.0	-0.427527	0.6803

R-squared	0.477423	Mean dependent var	5928974.
Adjusted R-squared	-1.090309	S.D. dependent var	9173392.
S.E. of regression	13262800	Akaike info criterion	35.73691
Sum squared resid	1.41E+15	Schwarz criterion	36.87063
Log likelihood	-564.6590	Hannan-Quinn criter.	36.11837
F-statistic	0.304531	Durbin-Watson stat	2.963748
Prob(F-statistic)	0.988709		