

12-1-2013

Domestic credit growth and international capital flows: implications for monetary policy management in Nigeria

Moses K. Tule

Follow this and additional works at: <https://dc.cbn.gov.ng/efr>

Recommended Citation

Tule, Moses K. (2013). Domestic credit growth and international capital flows: implications for monetary policy management in Nigeria. *Economic and Financial Review*, 51(4), 97 - 127.

This Article is brought to you for free and open access by CBN Institutional Repository. It has been accepted for inclusion in *Economic and Financial Review* by an authorized editor of CBN Institutional Repository. For more information, please contact jelongshak@cbn.gov.ng.

Domestic Credit Growth and International Capital Flows: Implications for Monetary Policy Management in Nigeria

Moses K. Tule*

I. Introduction

The financial crises of the last three decades have spurred interest in the dynamics of international capital flows. A number of studies have examined the behaviour of net capital flows, namely the difference between the foreign purchase of domestic assets (or capital inflows by foreigners) and the domestic purchase of foreign assets (or capital outflows by domestic agents). However, the literature is scanty about the individual behaviour of these two components on net capital flows.

Foreign capital flows, i.e. Foreign Direct Investment, FDI, (investment in real assets) and Foreign Portfolio Investment (investment in financial assets) often come in waves. During the 2008 global financial crisis, two key contributory factors that were identified in the crisis were the balance sheet problems associated with rapid credit growth in some countries (most obviously, Ireland and Spain) during the pre-crisis period and excessive external imbalances (Lane and McQuade, 2013). Easy availability of credit in the U.S., fueled by large inflows of foreign funds after the Russian debt crisis and Asian financial crisis of the 1997–1998 periods, led to a housing construction boom and facilitated debt-financed consumer spending. Lax lending standards and rising real estate prices also contributed to the real estate bubble. Loans of various types (e.g., mortgage, credit card, and auto) were easy to obtain and consumers assumed an unprecedented debt load. For instance, Lane and Milesi-Ferretti (2011) have documented that the variation in the size of recessions during 2008-2009, was significantly related to the scale of credit growth during the 2003-2008 period and the size of outstanding current account imbalances.

In related study, Lane and Milesi-Ferretti (2011) show that above-normal current account deficits during the pre-crisis period was significantly associated with major declines in domestic demand and sharp reversals in private capital flows over 2008-2010. Foreign capital inflows, in principle, are necessary because they complement the domestic resources of the economy and enhance economic

* Moses Tule is the Director, Monetary Policy Department of the Central Bank of Nigeria. The usual disclaimer applies.

development. Hence, capital flows could contribute to amplifying economic cycles, fuel credit booms, appreciating the exchange rate, and could be subject to sudden reversals (Calvo, et al., 2008). For capital-scarce developing countries like Nigeria, off-shore capital inflows are desirable as they help to stimulate investment, employment and growth.

Ernst and Young (2013) showed that Nigeria has consistently ranked among the largest recipient of foreign capital in Africa, particularly FDI, over the last decade with amount totaling about US\$120 billion. It further estimated that FDI inflows to Nigeria will average about US\$23 billion per annum over the next five years. A spectra of variables which had helped to shore up the growth of foreign investor activity in the country, included improved international perception of the country's strong macroeconomic performance, debt relief, the global commodity (particularly oil) boom, improved governance situation and political stability (Ernst and Young, 2013). Liberalisation of the foreign exchange market and the lifting of restrictions on investors had also encouraged the entry of foreign investors into government and corporate debt market, equities, and money market instruments.

The growth in the number of Pan-African funds primarily established to satisfy the demand for Nigerian and sub-Sahara African exposure to foreign investors is another important factor. The shift towards portfolio flows shows the growing prominence of this source of external funding, as institutional investors search for better yields in Nigerian and other frontier markets' treasury bills, bonds, equities and currencies and, as against the unattractive interest rate regime prevailing in developed markets.

The demand for Nigeria's local debt by foreign institutional investors has remained high since October 2011 due to the high yields that have averaged 15 per cent over the last 3 years. The enabling regulatory environment and willingness of the Federal government to guarantee infrastructural bonds, has attracted even higher foreign portfolio capital inflows into the country. Thus, while foreign capital provides an important source of external financing for the country, especially in supporting domestic investment, the economy could be vulnerable to the volatile and speculative nature of such short-term portfolio capital flows, which are potentially injurious to macroeconomic management and are a major source of financial instability. Private capital inflows, which go to private sector agents, could reverse at the shortest notice, given an external shock or investor pessimism about the state of the macroeconomy.

The volatility in short-term capital flows became clearly manifest during the sub-prime mortgage crisis in 2008, when foreign investors pulled out of Nigeria and other frontiers markets' equities. This led to a loss of over 50 per cent of the value in many of these markets – a loss far higher than the loss recorded in the less open BRIC markets, particularly China and India.

Foreign capital inflows have the capacity to crowd out domestic investment; thus, making growth less sustainable compared with growth driven by domestic investment resources. While the analysis of the existence and extent of the spillovers of international capital flows to domestic credit has been done, such studies with empirical content on the impact on domestic credit for developing economies like Nigeria are still evolving. Against this background, this paper addresses four questions: how important and what is the structure, size and composition of international capital flows to Nigeria?; does international capital flow produce significant spill-over effects on domestic credit supply?; what is the relationship between international capital flow and domestic credit growth?; and what should be the reaction of the monetary authority to managing international capital flow risks? It is pertinent to state that the macroeconomic policy framework and its credibility are important for managing risks from rapid capital inflows and possible reversals. This paper investigates the effect of foreign capital flows on domestic credit growth, specifically, and its implication for monetary policy. The paper is structured into 6 sections. Section 2 provides the review of related theoretical and empirical literature. Section 3 provides stylized facts on the structure and changing structure of domestic credit and international capital flows in Nigeria while section 4 deals with capital flows and the dynamics of monetary policy in Nigeria. Section 5 provides the empirical analysis, while section 6 concludes the study.

II. Review of Related Theoretical and Empirical Literature

II.1 Theoretical Literature

The theoretical link between international capital flows and bank credit can be found in the context of the lending or boom-bust cycles following McKinnon and Pill (1996) and Giannetti (2007) as well as Daniel and Jones (2007) which brought to the fore the issue of financial globalisation, including liberalisation of the current account. Given the financial intermediation role of the banking system, an immediate impact could be, for instance, a precipitation of banking crises with attendant distortions to investment flow.

As it would become evident from the empirical perspective, lending booms are orchestrated by episodes of increased capital inflows; and huge credit

expansions are associated with financial liberalisation processes (domestic and international). Caballero (2010) opined "that after a liberalisation process a surge in capital inflows may take place during ... early stages of financial development, allowing banks a bigger pool of funds from which to provide lending, but at the same time magnifying the moral hazard and incentives problems in the banking industry".

Although these theoretical constructs are largely intuitive, an extension to the literature has been prompted due to the opaque nature of some of the empirical evidence in aiding our understanding of the nexus between international capital and domestic credit expansion. Such areas of extension as in Caballero (2010) are the apparent difficulty of empirics to offer strong evidence that surges in capital flows are systematically associated with lending booms. Its inability to suggest a direct link between the level of capital flows and domestic credit growth; which kind of capital flows are associated with credit growth; and do not attempt to identify surges in capital. Intuitively some studies link banking vulnerabilities to surges in capital flows, a fundamental theoretical channel with the view to identifying country-specific excessive capital surges.

The international capital flows literature is widespread and of different dimensions. It is evident as Reinhart and Reinhart (2009) and Cardarelli et al., (2010) showed that the periods of high capital inflow coincided with incidences of higher macroeconomic volatility. Furceri et al., (2011), Caballero (2010), Reinhart and Reinhart (2009) and Edwards (2007) also noted the amplified risk of financial and balance of payments fragility. Linking high capital flow episodes with credit and asset prices, Mendoza and Torrones (2008) showed its likely effect of engendering credit and asset price booms. Such studies such as Borio and Disyatat (2011), Gourinchas (2012), Obstfeld (2012a, 2012b) found that international capital inflows have a tremendous impact on the funding environment and alters the portfolio mix of financial assets of domestic banks and non-banks.

Furceri et al., (2011b) investigated the effect of capital inflow shocks on the growth of domestic credit using panel data of developed and emerging economies from 1970 to 2007. The study found that in the two years following the start of a capital inflow shock, the credit-to-GDP ratio rises by about 2 percentage points. They showed that this trend would reverse in the medium-term with the ratio declining by almost 4 percentage points, seven years after the initial shock. The paper found that the effect is different depending on the type of flows characterising the episode (debt vs. portfolio equity vs. FDI), with large capital inflows that are debt-driven having the largest effect. The paper suggested that the short-term effect of capital inflow shocks on domestic credit

depends on countries' macroeconomic policy stances. In particular, the study found that this effect is lower in countries with higher real exchange rate flexibility and fiscal policy counter-cyclicality.

Borio and Disyatat (2011) approached the issue of capital flows and credit growth by a re-examination of the view that current account surpluses in several emerging market economies drive credit booms and risk-taking in the major advanced deficit countries at the heart of the crisis, by significantly subduing world interest rates and/or by funding the booms in such countries. Consequently, they conjectured that the main contributing factor to the financial crisis was not "excess saving" but the "excess elasticity" of the international monetary and financial system: the monetary and financial regimes in place were unable to curtail the accumulation of unsustainable credit and asset price booms ("financial imbalances"). Thus, the authors identify credit creation, which characterises a monetary economy as playing a fundamental role as a mechanism of the transmission of international capital inflows to the domestic economy.

Specifically, the literature highlighted the link between international capital flows and domestic credit. To resolve whether surges in international capital flows are linked with a higher probability of banking crises, and if it could happen through a lending boom channel, Caballero (2010) found by applying data for over one hundred countries during 1973-2008 that episodes of higher surges in the previous year strongly propagate systemic banking crises and it was three times higher in the contemporaneous year. The author found that for intense surges they operated through a mechanism other than lending booms. However, mild surges that result in crises were shown to be mainly through their association with lending booms. The study found that capital flow surges in both debt and portfolio-equity flows are associated with future crises although, portfolio flows produce a higher chance of a crisis.

Lane and McQuade (2013) showed that the main covariation pattern is between net international debt flows and domestic credit growth, noting that international equity flows were inconsequential channel of impact to the domestic economy. Luca and Spatafora (2012) found that both net capital flows and domestic credit benefitted from reductions in the global price risk and low interest rates. They noted also that greater domestic credit as capital inflow surge could increase the extent to which capital inflow transmit beneficially into the domestic economy. Indeed, Shin (2012) showed that movement of capital between Europe and the United States was responsible for the US credit boom in the mid-2000s. This point was similarly underscored by Cetorelli and Goldberg (2012), where they

highlighted the role of cross-border internal funding in determining the behaviour of global banks.

Bruno and Shin (2012) examined the relationship between international banking-sector flows and domestic private credit, noting that global liquidity and the leverage cycle of global banks as a key driver of credit growth in the countries that the authors studied. Jordá, et al. (2011) found that time was of paramount importance in the international capital flows and domestic credit growth dynamics, noting that although the bilateral correlation between credit growth and the current account was less important historically, it turned significant after 1975.

According to Magud, et al (2012) capital flow surges have frequently resulted in dramatic credit expansions in the advanced and emerging market economies. Analysing the effect of exchange rate elasticity on credit markets in episodes of huge capital inflows, the authors found that bank credit expands more swiftly in the emerging markets. Their findings showed that credit composition inclines to foreign currency in economies with relative rigid exchange rate regimes, and not predicated on whether the latter attract more capital inflows than economies with more flexible regimes. This points to the fact that countries with relatively rigid exchange rate regimes might benefit more from regulatory policies that streamline banks' incentives to access external markets and to lend/borrow in foreign currency. Some of such policies according to the author include "marginal reserve requirements on foreign lending, currency-dependent liquidity requirements, and higher capital requirement and/or dynamic provisioning on foreign exchange loans".

The literature, however, is salient on how monetary policy should react to managing capital flow risks in an oil rich environment, since it is very clear that there are country-specific peculiarities. In addition, for a developing country like Nigeria, it is not clear whether such spillovers produce significant influence on domestic credit as studies in this area is still scanty and evolving. The empirical evidence is still inconclusive on whether the relationship between international capital flow and domestic credit growth holds conventionally. It is obvious that domestic policy conditions could blur this link and assuming this possibility away could be misleading.

II.2 Theoretical Framework

The extent of integration of international capital markets influences researchers' view of the global economy and how economic convergence has evolved or might yet proceed. Capital is believed to always flow in the direction of large

profit differentials, and economists suggest that the evidence of interest arbitrage provides the evidence for perfect capital mobility. Thus, for an open economy, capital would always move in the direction of highest profit margin.

Inflows from abroad are a normal and necessary part of economic activity because financial intermediation between lenders and borrowers improves the efficiency of resource allocation and growth. The economic rationale for investing overseas is that investors could earn a higher economic return than the cost of invested funds and that these economic returns are then translated into financial returns. Foreign inflow problems for governments arise if the absorption capacity of the capital receiving country does not keep pace with growth in capital flows, leading to shocks to the domestic economy.

Feldstein and Horioka (1980) observed that, if domestic savings were added to a world saving pool and domestic investment competed for funds in that same world savings pool, there would be no correlation between a nation's savings rate and its rate of investment. The statistical evidence showed that, on the contrary, the long-term saving and investment rates of the individual industrialised countries in the OECD were highly correlated. The data were consistent with the view that a sustained one-percentage-point increase in the savings rate induced nearly a one-percentage-point increase in the investment rate. They found that domestic investment and saving rates were highly correlated. Their result focused on a strong condition for perfect capital mobility: if national saving declined, it should not necessarily "crowd out" domestic investment if the current account were able to take up the slack through capital inflows.

From the literature, four major approaches have been used to explain the theoretical basis for capital flows. They are the Mundell-Fleming model, the Current Account Models and Saving-Investment Balance and the Absorption approach. We rely specifically on the Current Account Models and Saving-Investment Balance in the balance of payments framework, to generate the theoretical basis for this study.

The balance of payments comprises the current account, capital account plus the monetary account (changes in reserve assets) which is really a settlement account of the above two. The current account represents payments related to *current* economic activities such as output, consumption, investment, employment, use of capital, etc. It is the sum of trade in goods and services, factor payments across countries (wage, interest, rent, dividend), and unilateral transfers (ODA grants, workers' remittances, gifts, among others). The capital account on the other hand, deals with payments related to transfers. The current

account plus the capital account makes up the overall balance which shows the sum of all autonomous transactions (both private and official), which may be positive or negative. Generally, a current account surplus means that a country is producing more than it spends. It exports more than it imports, so the country is a *net lender* to the world. Conversely, a current account deficit means a country's spending exceeds its output i.e. imports are greater than exports, and the country is *borrowing from the world*. There are about four methods in the literature for determining the current account i.e. inter-temporal optimisation model; absorption approach; saving-investment balance approach and elasticities approach. However, the analysis in this study would be limited to two of these approaches - absorption approach and savings-investment balance approach.

II.2.1 Absorption Approach

The absorption approach is a macroeconomic-oriented approach which relies on macroeconomic identities. Its strength is simplicity and practicality, while the weakness is the lack of deep theoretical foundation. However, it is more useful for looking at the real conditions of a country.

Given the national income identity:

$$Y = C + I + G + X - M \dots \dots \dots 1$$

(Y: income, C: private consumption, I: private investment, G: government spending, X: exports and M: imports)

$$C + I + G \dots \dots \dots 2\dots$$

Equation 2, the so called "domestic demand" or "absorption" identity.

$$A = C + I + G \dots \dots \dots 3$$

The current account *CA* is $X - M$ (here, we ignore other items in the current account like ODA grants, factor income, etc).

$$CA = X - M \dots \dots \dots 4$$

From 4, we can see that

$$X - M = Y - A \dots \dots \dots 5$$

$$\text{or simply, } CA = Y - A \dots \dots \dots 6$$

The current account is an excess of a nation's production (=income Y) over absorption (=domestic demand or A). Y is what the country produces, A is what it spends (for consumption and investment), and the gap is CA.

Current account (*CA*) surplus means the country is saving part of its income, and a *CA* deficit means it overspends its income. If a country is experiencing a *CA* deficit, there are only two solutions provided by this model: increase Y or decrease A. Increasing Y is a supply-side problem. The IMF position is that

economic liberalisation (free trade, privatisation, deregulation, among others) would favour private sector investment and boost output.

Decreasing A is a demand-side problem. Usually, it means austerity--tight budget and tight money. This is the most traditional IMF conditionality. Thus, the classical solution is macroeconomic adjustment combined with economic liberalisation.

II.2.2 Saving-Investment Balance Approach

The saving-investment approach is very similar to the absorption approach, because it is based on one macroeconomic-oriented additional simple identity. Recall the previous national income identity on the *expenditure* side:

$$Y = C + I + G + X - M \dots \dots \dots 1$$

To this, we add the national income identity on the *disposal* side (how people earn income and allocate it to different uses):

$$Y = C + S + T \dots \dots \dots 2$$

(S : saving, and T : taxes)

This says that income is divided into consumption, saving and taxes. Combining equations 1 and 2, we have:

$$X - M = (S - I) + (T + G) \dots \dots \dots 3$$

Equation 3 is an identity. $CA = (X - M)$ is identically equal to *net private saving* ($S - I$) plus *net government saving* ($T + G$). The current account is the net savings of the two sectors combined. According to this view, a CA deficit means that either the private sector or the government (or both) have negative savings (called *dissaving*). In many cases, the government overspends its budget. Alternatively, maybe both sectors are dissaving (i.e., suffer from savings shortage). There are two possible ways to reduce the deficit in the current account: increase net private savings or increase net government savings. To increase net private savings ($S - I$), discouraging investment is generally undesirable (unless there is an investment bubble). The better solution is to encourage private savings. Various institutional adjustments (tax system, banking, housing, pension, social security and insurance, among others, could be carried out to strengthen incentives to save and remove incentives to consume more. To increase net government savings ($T + G$), taxes must go up to increase revenue or a cut in expenditure is desirable.

In a closed economy, the national return on additional savings is the domestic marginal product of capital. The question of whether the government should pursue policies to increase the savings rate is therefore equivalent to deciding whether this domestic marginal product of capital offers a high enough reward to justify postponing consumption. Although taxes on capital income could

reduce the net yield that individual investors receive, the country as a whole receives both the after-tax yield and the tax revenue; it is this pre-tax marginal product of capital that should influence national saving policy in a closed economy.

In contrast, if capital is perfectly mobile between countries, most of any incremental saving will leave the home country (if it is already a capital exporter) or will replace other foreign source capital that would otherwise be invested in the home country (if it is already a capital importer). In this case, the yield to the home country on the additional savings is only the net-of-tax return received by the investor and not the pre-tax marginal product of capital. On the other hand, the foreign governments collect the additional tax revenue, if the additional savings is invested abroad. If the additional savings reduces capital imports into the home country, the tax revenue of the domestic government remains unchanged and national income rises only by the after-tax returns.

From the model, fixing the so-called investment-savings mismatch would require capital inflow from abroad to finance investment activity or to supplement domestic savings. Most developing economies view the need to attract foreign capital to supplement domestic resources as significant, in view of growing mismatch between their capital requirements and saving capacity. For many of them, foreign capital is a key element in their development strategy against the other forms of foreign financing like debt.

II.2.3 The Mundell-Fleming Model

The Mundell-Fleming model is an extension of the IS-LM model. Whereas the traditional IS-LM Model deals with economy under autarky (or a closed economy); the Mundell-Fleming model describes an open economy. Unlike IS-LM model which shows the relationship between interest rate and output in the short run, the Mundell-Fleming model portrays the relationship between the nominal exchange rate and an economy's output.

The model argues that an economy cannot simultaneously maintain a fixed exchange rate, free capital movement, and an independent monetary policy. The literature refers to this principle as "the Unholy Trinity," the "Irreconcilable Trinity," the "Inconsistent trinity" or the Mundell-Fleming "trilemma.". From the Mundell-Fleming model, when the global interest rate increases above the domestic rate, capital flows out to take advantage of this opportunity. The traditional model relies on the following equations:

$$Y = C + I + G + X - M \dots\dots\dots 1$$

Where Y is GDP , C is consumption, I is Investment, G is government spending and $X - M$ is net exports.

$$\frac{M}{P} = L(i, y) \dots\dots\dots 2$$

Where M is money supply, P is average price, L is liquidity, i is the interest rate and Y is GDP

$$BOP = CA + KA \dots\dots\dots 3$$

Where CA is the current account and KA , the capital account.

IS Components

$$C = C(Y - T, i - E(\pi)) \dots\dots\dots 4$$

Where C is consumption, Y is GDP , T is taxes, i is the interest rate, $E(\pi)$ is the expected rate of inflation.

$$I = I(i - E(\pi), Y_{-1}) \dots\dots\dots 5$$

Where I is investment, i is the interest rate, $E(\pi)$ is the expected rate of inflation, Y_{-1} is GDP in the previous period.

$$G = G \dots\dots\dots 6$$

Where G is government spending, an exogenous variable.

$$NX = NX(e, Y, Y^*) \dots\dots\dots 7$$

Where NX is net exports, e , is the real exchange rate, Y , is GDP , Y^* is the GDP of a foreign country.

BoP Components

$$CA = NX \dots\dots\dots 8$$

Where, CA is the current account and NX is net exports.

$$KA = z(i - i^*) + k \dots\dots\dots 9$$

Where z the level of capital mobility, i is the interest rate, i^* is the foreign interest rate, k is capital investments not related to i , an exogenous variable. KA , is the capital account.

An increase in the global interest rate under flexible exchange rate regime would cause an upward pressure on the local interest rate. The pressure subsides as the local rate closes in on the global rate. When a positive differential between the global and the local rate occurs, holding the LM curve constant, capital flows out of the local economy. This depreciates the local currency and helps boost net exports. Increasing net exports shift the IS curve to the right. This shift continues to the right until the local interest rate becomes as high as the global rate. A decrease in global interest rate causes the reverse to occur.

III. Structure and Dynamics of Credit and International Capital Flows in Nigeria

According to Broner et al., (2013a), gross capital flows, i.e. capital inflows by foreigners and capital outflows by domestic agents, are large and volatile both in absolute terms and relative to the size and volatility of net capital flows. While the size and volatility of net capital flows have remained unevenly constant over the last decades, both have increased significantly over time for gross capital flows reflecting an increasingly positive correlation between capital inflows by foreigners and capital outflows by domestic agents (Broner et al., 2013b). The literature has established that capital inflows are pro-cyclical and that related retrenchment towards home financial markets is particularly acute during crisis associated with information asymmetry of both foreign investors and domestic agents. The retrenchment during crises (banking, currency, and debt) affected all types of gross capital flows, including foreign direct investment (FDI) and portfolio investment (PI). However, reserves play an important role in the contraction of capital flows in low-income countries (Broner et al., 2013b).

Dell'Erba and Reinhart (2013) suggested that unlike other sectors of an economy, FDI surges in the financial sector are accompanied by a boom-bust cycle in GDP growth and driven largely by global and contagion factors. They emphasised that financial-sector FDI is a less safe capital flow than other types of FDI contrary to other literature on the impact of capital controls such as Magud et al. (2011), which claimed that a shift in the composition towards FDI has been beneficial with respect to the riskiness of a country's external balance sheet. Furthermore, they argued that regulations restricting lending and borrowing in foreign currencies, reducing the prospect of surges in financial-sector FDI, might have implications for the design of future prudential regulation policies.

III.1 Structure and Dynamics of Domestic Credit

Relative to other economies during the crisis years, there have been consolidation of loans to the private sector segment in Nigeria, from ₦2,303.70 billion or 52.1 per cent of GDP in 2006Q2 to ₦15,692.03 billion or 153.8 per cent of GDP in 2013Q2. However, credit to the Federal Government dropped by – ₦2,758.31 billion, from ₦360.79 billion or 8.15 of GDP to a deficit of ₦2,397.52 billion or -23.49 per cent of GDP in the same period. In the peak years of the crisis, there was an increase in government lending, given its consistent budget deficits and the reluctance of banks to lend to businesses to minimise bad loans. But in recent years, government lending has decreased owing to increased government borrowing in foreign markets.

Table 1: Dynamics and Structure of Domestic Credit in Nigeria

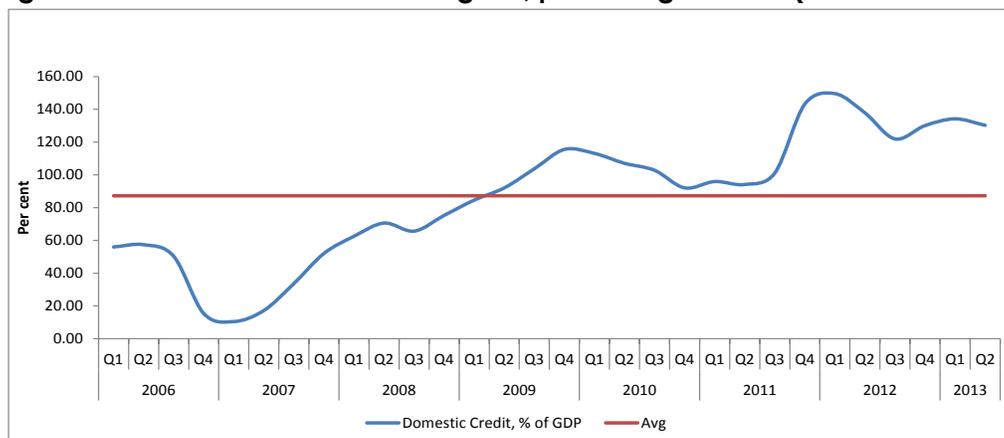
₦Billion		Domestic Credit	%GDP	Of which, granted:			
				Fed Govt	% GDP	Private Sector	%GDP
2006	Q1	2,598.85	65.49	471.89	11.89	2,126.96	53.60
	Q2	2,664.49	60.20	360.79	8.15	2,303.70	52.05
	Q3	2,336.53	46.86	-235.14	-4.72	2,571.68	51.57
	Q4	714.21	13.83	-1,936.62	-37.49	2,650.82	51.32
2007	Q1	540.32	11.40	-2,508.63	-52.92	3,048.94	64.31
	Q2	888.71	18.31	-2,615.01	-53.88	3,503.72	72.18
	Q3	1,740.31	31.50	-2,462.86	-44.58	4,203.17	76.08
	Q4	2,688.24	48.54	-2,368.48	-42.77	5,056.72	91.30
2008	Q1	3,462.33	62.54	-2,502.00	-45.20	5,964.33	107.74
	Q2	4,038.24	70.60	-2,716.45	-47.49	6,754.68	118.08
	Q3	4,244.63	65.69	-3,230.04	-49.99	7,474.67	115.67
	Q4	4,951.86	75.28	-3,107.69	-47.24	8,059.55	122.52
2009	Q1	4,620.52	84.61	-3,605.92	-66.03	8,226.44	150.65
	Q2	5,406.93	92.07	-3,150.02	-53.64	8,556.94	145.71
	Q3	6,854.25	103.72	-2,957.11	-44.75	9,811.36	148.47
	Q4	7,917.04	115.54	-2,302.29	-33.60	10,219.34	149.14
2010	Q1	8,401.20	113.12	-1,649.47	-22.21	10,050.67	135.33
	Q2	8,612.94	107.08	-1,489.88	-18.52	10,102.82	125.61
	Q3	9,309.84	102.81	-1,026.28	-11.33	10,336.11	114.14
	Q4	8,708.55	92.06	-1,121.80	-11.86	9,830.34	103.92
2011	Q1	8,206.79	95.94	-1,240.16	-14.50	9,446.95	110.44
	Q2	8,889.64	94.12	-1,068.31	-11.31	9,957.95	105.43
	Q3	9,962.53	101.08	-1,148.21	-11.65	11,110.74	112.73
	Q4	13,686.73	143.24	-496.86	-5.20	14,183.59	148.44
2012	Q1	13,679.08	149.61	-440.81	-4.82	14,119.89	154.44
	Q2	13,567.43	137.88	-1,133.63	-11.52	14,701.06	149.40
	Q3	13,376.40	121.97	-1,377.60	-12.56	14,754.00	134.53
	Q4	13,782.53	130.10	-1,353.19	-12.77	15,135.71	142.87
2013	Q1	12,740.97	134.20	-2,520.97	-26.55	15,261.94	160.76
	Q2	13,294.51	130.28	-2,397.52	-23.49	15,692.03	153.77

Source: Authors' calculation based on CBN Monetary Survey for various years.

III.1.1 Dynamics of Total Domestic Credit

In absolute terms, the total domestic credit rose by ₦10,630.02 billion, from ₦2,664.49 billion or 60.2 per cent of GDP in 2006Q2 to ₦13,294.51 billion or 130.3 per cent of GDP in 2013Q2. Reasons for the increase was attributed to CBN's policies which promoted certainty in macroeconomic management and its interventions programmes such as funding of DFIs (Bank of Industry, among others) and establishment of Assets Management Corporation of Nigeria (AMCON) that enabled banks to regain financial capacity for credit.

Figure 1: Total Domestic Credit in Nigeria, percentage of GDP (2006Q1– 2013Q2)



The dynamic nature of domestic credit is relatively strong compared with the period up to 2009. Although higher than the value at the beginning of the crisis, total domestic credit recorded contraction of 6.3 per cent of GDP in 2010 compared to 31.9 per cent of GDP in 2009. Following the crisis period when the intermediary role of banks experienced decline, their lending capacity maintained a value above ₦13, 500 billion in 2011 and 2012.

III.1.2 Dynamics of Capital Flows: Stylized Facts

Nigeria has gradually been opening up its capital account, with increase in capital flows reflecting liberalisation and a relatively easy restrictive environment. One major factor for increase in private inflows is financial stability brought about by reform and improved macroeconomic environment. Moreover, a number of emerging and developing economies appeared relatively insulated from the first round effects of the crises that engulfed major financial centres and 'temporary safe havens' for international capital flows to take advantage of interest differentials.

With the financial reforms and macroeconomic stability, Nigeria has continued to receive substantial inflows in the form of portfolio inflows as investment in the bonds and equities markets since 2004. During the crisis period in 2008, inflows slightly recessed but recovered in 2010. The direction of net capital flows depends on many factors. Prasad and Rajan (2008) pointed to a variety of factors that make impact of capital account liberalisation less predictable. Some determinants of net flows are the domestic business cycle, growth prospects, world business cycle and financial sector liberalisation (Bayoumi and Ohnsorge, 2013).

Capital flows to Nigeria, measured by current account balance, decreased by US\$1,902.71million or 23.7 per cent of GDP, from a surplus of US\$8,039.23million or 21.7 per cent of GDP in 2007Q1 to US\$6,136.52 million or 10.2per cent of GDP in 2013Q1.From 2007Q1 until 2013Q3, the current account averaged surplus of US\$4,795.9 million, reaching a high of US\$8,910.46 million in 2008Q4 and a negative of US\$3,862.83 million in 2011Q3. During the crisis years, the capital flows slowed, averaging US\$3,355.10million or 5.8 per cent and US\$2,190.20million or 3.8 per cent in 2010 and 2011, respectively, compared with US\$7.324.08 million on average or 8.6 per cent of GDP in 2009. Following improved macroeconomic performance and positive external developments, capital flows in Nigeria recovered to average of US\$5,107.09 million or 7.8 per cent of GDP in 2012.

Table 2: Capital Flows in Nigeria, 2007Q1 – 2013Q2

Capital Inflows in Nigeria, US\$ Million (2007Q1 – 2013Q2)																										
	2007				2008				2009				2010				2011				2012				2013	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Foreign Direct Investment	667.88	1,070.11	1,688.54	854.05	1,225.34	1,746.31	712.43	977.30	1,451.34	793.70	424.16	657.19	73.93	212.21	299.29	143.50	553.73	469.53	340.18	389.90	524.76	214.24	421.16	839.71	561.42	490.91
Equity	643.89	1,068.09	1,684.53	847.02	1,188.52	1,725.88	706.95	976.33	1,449.89	793.17	422.26	650.55	66.43	197.17	294.28	110.46	536.76	427.34	177.46	357.34	512.26	195.36	412.06	812.33	541.31	400.80
Other capital	23.99	2.02	5.01	7.02	36.71	20.44	5.49	0.97	1.65	0.53	11.91	6.64	7.50	15.04	5.01	33.04	16.97	42.20	162.72	32.56	12.51	18.89	9.10	27.37	20.11	0.11
Portfolio Investment	469.63	681.62	970.97	1,577.25	1,552.42	744.73	698.21	484.34	266.54	451.10	451.23	351.14	1,052.18	820.05	993.01	1,091.67	1,015.09	1,364.12	1,094.65	1,039.26	2,955.94	2,301.56	3,413.90	4,816.41	5,759.51	4,487.59
Equity	337.25	271.36	786.08	1,093.77	892.02	457.53	516.77	483.64	285.14	408.23	401.23	348.64	927.58	580.58	631.95	842.89	940.30	1,068.32	812.12	870.77	2,634.50	1,991.04	2,982.28	4,213.00	4,930.55	3,934.21
Bonds	131.52	410.00	116.90	399.68	307.57	60.16	52.32	-	-	12.62	-	-	-	0.07	-	0.10	13.30	33.75	19.34	74.41	131.81	10.16	368.80	599.42	150.74	
Money Mkt Instruments	0.86	0.26	68.00	78.80	362.82	227.04	69.12	0.70	1.40	30.25	50.00	2.50	124.60	239.40	271.06	248.78	74.69	282.51	248.78	149.15	246.74	178.71	421.46	234.61	220.54	402.55
Other Investments	361.62	275.59	341.31	618.61	1,436.02	803.10	538.48	301.11	84.52	187.51	259.44	305.02	633.97	307.54	297.93	160.42	238.11	732.21	176.92	490.06	135.81	315.93	268.40	388.39	288.64	729.25
Trade credits	-	-	-	82.72	-	15.00	-	-	7.41	-	0.51	-	-	-	0.15	-	-	-	-	1.37	43.67	-	0.87	-	-	-
Loans	350.45	275.51	339.93	535.50	1,348.22	593.47	492.78	301.11	84.52	179.90	252.74	299.51	633.27	306.54	297.32	160.35	213.74	732.21	176.92	488.42	85.45	315.06	277.54	355.07	286.27	690.61
Currency deposits	-	-	-	-	-	-	-	-	-	3.20	6.00	-	-	-	-	-	-	-	-	-	-	-	30.03	1.73	-	
Other claims	11.17	0.08	1.37	0.39	87.80	194.63	45.70	-	0.20	2.51	-	0.70	1.00	0.45	0.07	24.37	-	-	0.27	6.69	0.87	9.99	3.29	0.64	38.64	
Current Account Balance	8,839.23	9,213.47	1,300.29	9,327.54	8,447.46	9,681.33	1,366.32	9,801.19	4,029.34	4,617.88	651.72	4,975.05	1,360.84	3,705.43	1,941.34	6,412.79	4,716.07	5,413.99	(3,862.83)	2,492.76	4,901.06	1,897.76	3,910.46	4,929.08	6,136.52	N/A
Int. Investment Position																										
Assets	77,498.53				88,463.64				83,928.45				83,668.50				101,690.91				N/A					
Liabilities	66,289.60				75,622.12				84,652.42				94,054.42				106,420.90				N/A					
Net	11,208.93				12,841.52				(723.97)				(10,385.92)				(4,729.99)									

Source: CBN Statistical Bulletin for various years

In terms of the composition of capital inflows, FDI declined by US\$266.97 million, from US\$667.88 million or 1.8 per cent of GDP in 2007Q1 to US\$400.91 million or 0.6 per cent of GDP in 2013Q2. Although FDI value has recovered to an average of US\$499.92 million or 0.8 per cent of GDP in 2012, from the crisis period of US\$182.23 million average or 0.3 per cent of GDP in 2010, it remained modest compared with the pre-crisis period. In contrast, portfolio investment increased by US\$9,719.31million, from US\$3,694.47million or 2.3 per cent in 2007 to US\$13,413.78 million or 5.6 per cent of GDP in 2012. Portfolio investment (PI) share of private capital flows to Nigeria has been on a phenomenal increase that by 2010, PI has surpassed every other type of capital inflows into Nigeria with FDI and Trade Credits declining in absolute terms. This is attributable to the positive effect of the CBN's policy on foreign investment in short-term instruments and the relatively high yield on those instruments.

Given these developments, Nigeria's net international investment position has recovered significantly by -US\$15,938.92million, from US\$11,208.93million or 25.7 per cent of GDP in 2007 to negative of US\$4,729.99million or -7.8 per cent of GDP in 2011, reflecting an increase in external financial liabilities of the economy. During the crisis period, the net international investment position declined to negative of US\$10,385.92million or -16.5 per cent of GDP in 2010.

IV. Empirical Presentation and Analysis

IV.1 Methodology

This section presents the data sources and methodology adopted. Domestic credit growth was measured as the quarterly ratio of credit to private sector to GDP. In terms of aggregate net flows, the current account balance (CAB) was included. Aggregate net flows between net debt flows and net equity flows were splitted. Quarterly data from the first quarter of 2000 to the second quarter of 2013 was used. In relation to other possible covariates of domestic credit growth, net domestic credit was examined, which was taken from the Central Bank of Nigeria's Monetary Survey. The data were sourced mainly from the Central Bank of Nigeria.

A dummy variable (E) was constructed to capture the role of net flows. The deviation of the credit to GDP ratio from its historical trend was used, where the dummy takes a value of 1, if the trend deviation is higher than the standard deviation of the de-trended levels. The trend level is obtained using the Hodrick-Prescott (HP) Filter, while the trend deviation is the standard deviation of the trend. Essentially, this measure captures the impact of large episodes of inflow on the change in the credit to GDP ratio and in particular, how persistent changes in the credit ratio had been. The study adopted the ordinary least square estimation method for the empirical analysis. Prior to estimation, unit root tests were conducted to test for the statistical properties of the data by leveraging on the Augmented Dickey Fuller (ADF) test, for the existence of unit roots. Using co-integration technique the study assessed the long-run stability of the model. The study used two measures of domestic credit namely; the ratio of private sector credit to GDP and net domestic credit. Capital flows was measured by current account balance (CAB), foreign direct investment (FDI) and foreign portfolio investment (FPI). Net debt and net equity flows were removed because of incomplete data series.

IV.2 Estimation Technique and Model Specification

The literature on capital flows contains three main classes of models explored to investigate the impact of foreign capital inflows on domestic credit. They include

the multi-equation model; vector auto-regressive (VAR) models and simple linear models. Estimations based on VAR models captured the dynamic inter-relations between domestic credit growth and international capital flows. As Okpanachi (2012) observed, VAR based and other multi-equation models typically endogenise capital flows (Christensen, 2004) and other variables that may not in reality belong to the system (Kwack 2001, Glick and Hutchison, 2000).

IV.2.1 The Model

In the wake of rising capital inflows and the possibilities of sudden stops, borrowing in the international credit markets by credit creating institutions to lend in the domestic credit markets to close the loan gap, has become a sort of a concern in the macro-prudential literature. Although, it is not yet established if Nigerian banks are hugely leverage to foreign institutions and it is not in doubt that capital flows in addition to other market related factors constitute drivers of domestic credit expansion. In Nigeria, monetisation of oil receipts impact domestic liquidity through the creation of net foreign assets, and in recent times, the country has received significant inflows that require the understanding of their impact on credit growth. Overleveraging of domestic financial institutions could result in a financial crisis in the face of sudden capital reversals prompting corrective measures and the placement of trigger thresholds such as cap on credit to GDP ratio for policy interventions. Thus, following Lane and Mcquade (2012), this study specify the credit cycle to include both short-and long- run dynamics of relevant capital inflow variables such as FDI, FPI and CAB given the observed link between capital flows and domestic credit growth. Other factors include money supply, output growth and GDP per capita. This paper adopts the single equation approach given the generally unidirectional causality of other factors to credit to GDP ratio and the near absence spillover of capital flows and domestic credit growth. Other factors include: money supply, output growth, and GDP per capita. This paper adopts the single equation approach, given the generally unidirectional causality of other factors to credit to GDP ratio and the near-absence spillover of credit to other economies as a small open price taking country. The algebraic representation of the model is of the form:

$$CRDT_{it} - CRDT_{it-w} = \phi_0 - \phi_q CRDT_{it-w} + \phi_q \ln(GDPPC_{it-w}) + \phi_q M2_{it-w} + \phi_q GDP + \phi_q * \sum_{k=t-(w+1)}^{k=t} INTFLOWS_{ik} + e_{iw} \dots \dots \dots 5.1$$

Where, $CRDT_t$ is the level of domestic credit to the private sector (expressed as a ratio of GDP), NDC is net domestic credit, and measures of international financial flows (INTFLOWS), namely, current account balance (CAB), foreign direct investment (FDI) and foreign portfolio investment (FPI). The inclusion of the

lagged level of credit $CRDT_{t-1}$ and the lagged level of GDP per capita ($GDPPC$) is to capture convergence dynamics.

IV.3 Empirical Analysis

Table 1: Correlation Results

	CPGDP	LFDI	LFPI	LGDPPC	LM2	LNDC	LNGDP	LCAB
CPGDP	1							
LFDI	0.031367	1						
LFPI	0.734214	0.206404	1					
LGDPPC	0.742707	0.354797	0.786981	1				
LM2	0.876089	0.262165	0.828028	0.965728	1			
LNDC	0.838256	0.12853	0.684737	0.868628	0.899841	1		
LNGDP	0.760561	0.343555	0.79846	0.999259	0.971656	0.879068	1	
LCAB	0.227888	0.52538	0.403361	0.589264	0.486582	0.375442	0.581177	1

Examining the different measures of capital flows, the correlation analysis shows that foreign portfolio investment has a significant correlation with ratio of private credit to GDP (0.73) and net domestic credit (0.68), whereas, the correlation between foreign direct investment and these same variables were clearly insignificant recording, (0.03) and (0.13) respectively. The correlation analysis between foreign direct investment and nominal GDP showed a weak relationship (0.34). The outcome is in line with the theoretical linkage between credit and output, suggesting that whatever impacts on credit also affect domestic production. Another striking feature is the weak correlation pattern observed between current account balance (CAB) and domestic credit, which suggests that, unlike other jurisdictions, the CAB, is not a significant determinant of the level of domestic credit. This result is in tandem with Lane and Mcquade (2012) who in their study on domestic credit and international capital flows found that the CAB is inadequate for measuring capital flows.

Table 2: Unit Root Tests

Variable	First Difference	Included Constant	Order of Integration
Current Account Balance	-10.75407	a	I(1)
Credit to the private sector	-4.692426	a	I(1)
Foreign Direct Investment	-4.491409	a	I(1)
Foreign portfolio investment	-6.674672	a	I(1)
GDP Per Capital	-2.950762	a	I(1)
Broad Money Supply	-8.050618	a	I(1)
Net capital flows	-3.375716	a	I(1)
Nominal GDP	-7.680868	a	I(1)
Net Domestic Credit	-4.739160	a	I(1)
Credit to GDP ratio	-5.655079	a	I(1)
Credit to GDP ratio(2)	-3.746064	a	I(1)

Augmented Dickey Fuller critical values: 1.0 per cent: **-3.568308**; 5.0 per cent: **-2.921175**; 10.0 per cent: **-2.598551**. The parameter a is the included constant in the ADF model

Table 3: Pairwise Granger Causality Tests

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LFDI does not Granger Cause CPGDP	52	0.66582	0.5186
CPGDP does not Granger Cause LFDI		0.96151	0.3897
LFPI does not Granger Cause CPGDP	52	2.53226	0.0903
CPGDP does not Granger Cause LFPI		0.47075	0.6274
LGDPPC does not Granger Cause CPGDP	52	4.27033	0.0198
CPGDP does not Granger Cause LGDPPC		0.87031	0.4255
LM2 does not Granger Cause CPGDP	52	2.86434	0.0670
CPGDP does not Granger Cause LM2		0.87864	0.4221
LNDC does not Granger Cause CPGDP	52	0.10869	0.8972
CPGDP does not Granger Cause LNDC		3.50102	0.0383
LNGDP does not Granger Cause CPGDP	52	4.27525	0.0197
CPGDP does not Granger Cause LNGDP		0.76262	0.4721

IV.3.1 Time Series Properties

Results from the Granger causality test reveal that one-way causality exists from foreign portfolio investment, per capita income, money supply and nominal GDP to credit growth measured by credit to the private sector-GDP ratio. However, there is no evidence of causality between foreign direct investment and credit to GDP ratio.

The unit root test using Augmented Dickey Fuller (ADF) test shows that all the variables, namely; current account balance, credit to the private sector, foreign direct investment, foreign portfolio investment, GDP per capita, broad money supply, net capital flows, nominal GDP, credit to GDP ratio and credit to the core private sector to GDP ratio were non-stationary series of order 1 i.e $I(1)$. This implies that linear combination between credit growth and its determining factors is stationary, an indication of the existence of a long-run relationship. The intuition of the unit root results is that credit flows to domestic economy can be explained in the long-run by these variables and the adjustment process can be represented by an error correction from where the speed it takes for any distortion in the credit flows to return to its steady state could be inferred. If this holds, then it is possible for policy to target the explanatory variables and achieve desired stimuli to domestic credit conditions.

The result from the Engle-Granger cointegration test confirms that the residuals generated from the long-run equation (Table 4) is stationary using the ADF-test. Inclusion of the current account balance (CAB) in the equation yielded no significance in the error correction model and therefore was excluded from the static long-run equation to eliminate plausible noise in the final short-run dynamic model. This is obvious, given that our economy is less dependent on grant inflows as it is obtainable in other jurisdictions and resource inflow within the period used are devoid of any sudden shocks. Thus, credit was modeled as an error-correction adjustment process that enabled the determination of not only the short-run dynamics, but also enabled the assessment of the contemporaneous and long-run impact on credit, arising from both domestic and external factors, including sources of capital inflows.

IV.3.2 Analysis of the Error-Correction Estimates

Estimates from the static equation suggest the absence of contemporaneous effects from two measures of international capital flows: foreign direct investment and foreign portfolio investment that is not significantly different from zero. The domestic factors, namely, per capita GDP, broad money supply and nominal GDP show strong significance in explaining the movement in credit. Since the errors from this equation are mean reverting i.e. being able to return to their

means after a distortion, a model that includes both dynamic distributed lags of differenced variables and the long-run variables were estimated to include an error-correction term.

First, from the short-run dynamic model, the coefficients are semi-elasticities. Aside the dependent variable, credit to GDP ratio, all other variables were log-transformed. The signs of the variables are appropriate and consistent with theoretical expectations. All determinants, including the predetermined variable (lag of credit to GDP ratio), which measures how persistence credit growth has evolved, were all significant at the 1.0 per cent level.

A sensitivity analysis was conducted on the estimates, by including a dummy (E) to capture the role of net flows. The dummy variable constructed was by taking the deviation of the credit to GDP ratio from its historical trend where the dummy takes a value 1 if the trend deviation is higher than the standard deviation of the de-trended levels. Essentially, this measure captures the impact of large episodes of inflow on the change in the credit to GDP ratio and in particular, how persistent changes in the credit ratio had been. The coefficients are generally stable and the level of significance remains robust but the dummy was insignificant. The import of such evidence implies that episodes of large capital inflows have not been relatively huge and are inconsequential in affecting domestic credit. It could also mean that the nature of the Federation Account defines such flows as of a short-term nature when they eventually get deposited in the DMBs. Perhaps, rather than improve financial intermediation; banks prefer to invest in short-term government instruments and the CBN standing deposit facility.

The final model includes both short- and long- run dynamics. The error-correction coefficient shows a speed of adjustment of 28.0 per cent, which indicate how much of the disequilibrium that occurs in the previous quarter is corrected contemporaneously. The adjusted R-squared shows approximately 70.0 per cent explanatory power of the regressors. The variables are significant at 5.0 per cent, except foreign direct investment and the dummy. There is a weak form of long-run impact elasticity of foreign direct investment on the credit to GDP ratio. However, the relationship with FDI is positive.

The short-run effect of foreign portfolio investment is positive suggesting that a 1.0 per cent change in foreign portfolio investment leads to an increase of approximately 0.00027 per cent in the credit to GDP ratio. This shows that FPI is an important channel for domestic banks liquidity as this is an important entry window for foreign investors. The growing patronage of equities and bonds also

could be a fundamental reason for the significance of the FPI in explaining credit to GDP ratio. The result also shows that the contemporaneous credit to GDP ratio changes by 0.0032 per cent following a 1.0 per cent change in its one period lagged levels. On per capita GDP, its net effect on credit to GDP ratio is negative and is as much as 0.0033 per cent if it changes by 1.0 per cent. It suggests the sensitivity of the growth in per capita levels to the demand for bank credit. The demand for credit tends to be sluggish and elastic as per capita income levels expand. In terms of short-run effect, broad money supply is positive and a 1.0 per cent change in its level leads to approximately a change of 0.003 per cent in the credit to GDP ratio.

The long-run determinants are largely from foreign direct investment, broad money supply and nominal GDP. A 1 per cent change in the foreign direct investment results in a 0.00032 per cent change in the credit to GDP ratio in the long run. For the money supply, the coefficient is positive and results in a 0.001 per cent change in credit to GDP ratio. Nominal income surprisingly in the long term negatively influences the credit to GDP ratio to about 0.0012 per cent. However, it is intuitive to suggest that the level of credit has not expanded at concomitant pace with the growth in nominal GDP.

Table 4: Static Equation

OLS		
	(i)	(ii)
LFDI	-0.0290(0.02)	0.4255
LFPI	-0.0240(0.01)	0.1940
LGDPPC	-2.9635(0.74)	0.0002
LM2	0.9102(0.08)	0.0000
LNGDP	1.9277(0.70)	0.0082
C	-11.5535(2.46)	0.0000
Observations	54	
R-squared	0.94	
Adjusted R-squared	0.93	
Durbin-Watson	0.63	

Dependent variable is CPGDP from 2000Q1 to 2013Q2. The figures in parentheses are standard errors.

Table 5: Short-run Dynamic Model

OLS		
	(i)	(ii)
D(CPGDP(-1))	0.4457 (0.11)	0.0003
D(LFDI(-2))	-0.0086 (0.01)	0.5419
D(LFPI(-4))	0.03120 (0.01)	0.0112
D(LGDPPC)	-0.7723 (0.10)	0.0000
D(LGDPPC(-1))	0.3846 (0.12)	0.0022
D(LM2)	0.3645 (0.06)	0.0000
ECM(-1)	-0.2921 (0.11)	0.0105
Observations	49	
R-squared	0.72	
Adjusted R-squared	0.67	
Durbin-Watson	1.98	

Dependent variable is CPGDP from 2000Q1 to 2013Q2. The figures in parentheses are standard errors.

Table 6: Short-run Dynamic Model - Sensitivity to Net Flow Episodes

OLS		
	(i)	(ii)
D(CPGDP(-1))	0.4661 (0.11)	0.0002
D(LFDI(-2))	-0.0074 (0.01)	0.6225
D(LFPI(-4))	0.0325 (0.01)	0.0091
D(LGDPPC)	-0.7630 (0.11)	0.0000
D(LGDPPC(-1))	0.4027 (0.12)	0.0025
D(LM2)	0.3977 (0.10)	0.0003
E	-0.0091 (0.02)	0.6003
ECM(-1)	-0.2955 (0.11)	0.0104
Observations	49	
R-squared	0.72	
Adjusted R-squared	0.67	
Durbin-Watson	2.03	

Dependent variable is CPGDP from 2000Q1 to 2013Q2. The figures in parentheses are standard errors.

Table 7: Short- and Long- run Impact Model

OLS		
	(i)	(ii)
D(CPGDP(-1))	0.3181 (0.15)	0.0389
D(LFPI(-4))	0.0278 (0.01)	0.0446
D(LGDPPC)	-0.6733 (0.09)	0.0000
D(LGDPPC(-1))	0.3462 (0.16)	0.0341
D(LM2)	0.2972 (0.13)	0.0288
LFDI	0.0320 (0.02)	0.1056
LM2	0.0961 (0.04)	0.0218
LNGDP	-0.1195 (0.05)	0.0202
E	-0.0110 (0.02)	0.5553
ECM(-1)	-0.2814 (0.13)	0.0347
Observations	49	
R-squared	0.72	
Adjusted R-squared	0.67	
Durbin-Watson	2.03	

Dependent variable is CPGDP from 2000Q1 to 2013Q2. The figures in parentheses are standard errors.

IV.4 Policy Responses to Foreign Capital Inflows

Several studies have investigated the link between vulnerabilities and capital inflows. As a result, central banks globally have adopted a spectrum of measures to curb the tide especially, as it relates to overheating the system in terms of an economy's capacity to absorb such flows, real currency appreciation, and sudden stop or sharp reversal of inflows. Some of the measures canvassed in the literature (Cardarelli, 2009), include exchange rate intervention, sterilisation of the inflows, fiscal policy, and capital controls.

Against the background of the "impossible trinity" doctrine, a major guiding factor for ascertaining an appropriate exchange rate strategy to pursue would be to establish the quantum of inflows and its implications for the appreciation of the domestic currency. Thus, the size and structure of the inflows should guide the

decision of whether or not to intervene in the market. A major consideration for intervention is the concern that massive capital inflows may induce a steep exchange rate appreciation in a short period, damaging the competitiveness of export sectors and potentially reducing economic growth (Cardarelli, 2009). Moreover, if net capital inflows take place in the context of a current account deficit, the real appreciation could exacerbate the external imbalances, heightening the vulnerability to a sharp reversal of capital inflows. To stem this trend, some central banks accumulate reserves in order to keep the exchange rate from appreciating. This policy may lead to lax monetary conditions, thus creating the potential for overheating the economy and creating financial system vulnerabilities. In this case, real appreciation could occur via higher inflation, rather than through an increase in nominal exchange rates. This is why some authors have argued that it is more beneficial to allow the exchange rate to fluctuate to discourage short-term speculative capital inflows by introducing uncertainty on the changes in the value of the currency (Calvo et al., 1996).

Another area is the sterilisation of foreign receipts. The central bank could sterilise the monetary impact of intervention through open market operations and, change in the cash reserve requirement or transferring government deposits from the banking system to the central bank as was done by the CBN in July 2013. While the motives for sterilisation are clear, its effectiveness is less so and it could entail substantial costs. Often times, sterilisation measures are designed to prevent a decline in interest rates and maintain the incentives for continuing capital inflows, thus perpetuating the problem. Moreover, sterilisation often implies quasi-fiscal costs, since it generally involves the central bank exchanging high-yield domestic assets for low-yield reserves. Implementing sterilisation policy by increasing unremunerated bank reserve requirements shifts the cost to the banking system, thus, promoting financial disintermediation.

Thirdly, the use of fiscal policy to lessen the effects of capital flows on aggregate demand and the real exchange rate during a surge of inflows and its repercussions was examined. Kaminski et al, (2004), observed the pro-cyclical nature of fiscal policy in emerging markets. They noted that a fast growing economy generates revenues that feed into higher government spending, thus aggravating the problem. By contrast, greater restraint on expenditure growth has at least three benefits. First, by dampening aggregate demand during the period of high inflows, it also allows lower interest rates than otherwise and could therefore reduce incentives for inflows. Fiscal restraint alleviates the appreciating pressures on the exchange rate directly, given the bias of public spending toward non-traded goods (Calvo, Leiderman and Reinhart, 1996). Third, to the extent that it helps address or forestall debt sustainability concerns, it might provide

greater scope for a counter-cyclical fiscal response to cushion economic activity when the inflows stop. While discretionary fiscal tightening during a period of capital inflows might be problematic due to political constraints and implementation lags, the avoidance of fiscal excesses—holding the line on spending—could play an important stabilisation role. In particular, fiscal rules based on cyclically adjusted balances could help resist the political and social pressures for additional spending in the face of large capital inflows.

Fourthly, is the case for enforcing controls over cross-border flows. In an attempt to restrict the net inflow of capital, some jurisdictions have either imposed controls on capital inflows or removed controls on capital outflows. The argument in the literature is that some countries employ such control measures to attain a variety of policy objectives; one of which is to discourage capital inflows in order to reduce any tendency for the domestic currency to appreciate. Controls also reduce the risk associated with the sudden reversal of inflows, and maintaining some degree of monetary policy independence.

V. Conclusions

This study set out to explore the links between international capital flows and domestic credit growth, with a particular focus on understanding the Nigerian experience. The study covered the period 2006-2012. This period witnessed an unprecedented loosening of global monetary conditions, resulting in a rapid decline in interest rates and spreads in most developing countries. It also coincided with a rapid increase in capital inflows, domestic credit, and capital-market valuations throughout the developing world. The presence of large, exogenous financial shocks suggests that it might be possible to estimate with some confidence any underlying causal relationships. It is suggested that future research in this area should investigate the link between foreign capital flows and productive investment in developing countries.

The investigation revealed that the current account balances is not a reliable variable in understanding the impact of foreign capital inflows and domestic credit growth, in view of the strong asymmetry between net debt flows and net equity flows. However, it is striking that portfolio flows appears to be the relevant measure during the review period. This confirms the age long argument that FDIs, especially multinational corporations, are by their nature, not designed to benefit the recipient country. Rather, the FDI benefits more from the recipient country as they provide employment and market outlets for their home countries. The results are suggestive of leakages. For instance, some authors have argued that financial-sector FDIs is substituted as debt inflows when a country is implementing bond-inflow controls (Reinhardt and Deli'Erba, 2013). The fact that FDI and CAB

were a less significant capital flow than other types of foreign capital inflows in this study, puts an interesting twist on previous studies in this area that have argued that FDI flows into the financial sector may be related to macroeconomic instability in the receiving countries (Ostry et al., 2011).

Despite the apparent empirical evidence of the relationship between portfolio flows and domestic credit growth in Nigeria, the literature does not properly capture the exact nature of this relationship. There is thus the need for more empirical studies in this regard. Of importance, is the need to clearly appreciate better, both the direct link between international debt flows and domestic credit growth (for instance, through the international funding activities of domestic banks) and the indirect relation (the impact of portfolio flows on domestic macroeconomic and financial variables that can affect both supply and demand factors influencing domestic credit. In turn, these findings have implications for macro-prudential policy frameworks and the monitoring of '*hot money*'. In particular, the finding indicates that there is strong evidence that foreign capital inflows influence domestic credit growth. In terms of the appropriate monetary policy response, it is recommended that policy-makers should interpret domestic credit growth and external imbalances holistically.

References

- Asogwa, F. O., O. I. Monday and S. M. Urama (2013). "The Impact of Exchange Rate Dynamics on Capital Inflows in Nigeria (1970-2010)", *IISTE's Information and Knowledge Management* Vol. 3, No. 8.
- Bayoumi T. (1990). "Saving-Investment Correlations", *IMF Staff Papers* 37:2, June.
- Bayoumi T. and F. Ohnsorge (2013). "Do Inflows or Outflows Dominate? Global Implications of Capital Account Liberalization in China", *IMF Working Paper* No.WP/13/189.
- Bercuson K. B. and L. M. Koeing (1993). "The Recent Surge in capital Inflows to Three ASEAN Countries: Causes and Macroeconomic Impact", *SEACEN Occasional Paper* No 15.
- Bernanke B. S. (2005). "Monetary Policy in a World of Mobile Capital", *Cato Journal*, 25 (1): 1-14.
- Borio C. and P. Disyatat, (2011). "Global Imbalances and the Financial Crisis: Link or No Link?", *BIS Working Paper* No. 346.
- Broner F. T. Didier A. Erce, and S. Schmukler (2013). "International capital flows during crises: Gross matters", <http://www.voxeu.org/article/international-capital-flows-during-crises-gross-matters>.
- Broner F., T. Didier, A. Erce, and S. Schmukler (2013a). "Gross capital flows: Dynamics and crises", *Journal of Monetary Economics* 60, 113-33.
- Bruno V. and H. S. Shin (2013b). "Capital Flows, Cross-Border Banking and Global Liquidity", *NBER Working Paper* No. 18942.
- Caballero J. (2010). "Do Surges in International Capital Flows Influence the Likelihood of Banking Crises", *Economics Department Working Paper*, University of California Santa Cruz.
- Calvo G., Leiderman L. and Reinhart C. (1993). "Capital flows and real exchange rate appreciation in Latin America", *IMF Staff Papers* 40(1):108-151.
- Calvo G., A. Izquierdo and L-F Mejia (2008). "Systemic sudden stops: the relevance of balance-sheet effects and financial integration", *NBER Working Paper* 14026.
- Cardarelli R., S. Elekdag and A. Kose (2010). "Capital inflows: Macroeconomic Implications and Policy Responses", *Economic Systems*, 34 (4), 333 - 356.
- Cetorelli N. and L. Goldberg (2012). "Banking Globalization and Monetary Transmission", *Journal of Finance* 67(5), 181 - 1843.
- Christensen J. (2004). "Capital Inflows, Sterilisation, and Commercial Bank Speculation: The Case of the Czech Republic in the Mid-1990s", *IMF Working Paper* No. 218, International Monetary Fund, Washington DC.
- Daniel B. and Jones, J. (2007). "Financial liberalisation and banking crises in emerging economies", *Journal of International Economics*, 72 (1), 202-221.

- Dell'Erba S. and D. Reinhardt (2013). "Not all capital waves are alike: A sector-level examination of surges in FDI inflows", *Bank of England Working Paper* No. 474.
- Edwards S. (2007). "Capital Controls, Sudden Stops and Current Account Reversals", In S. Edwards (ed.), *Capital Controls and Capital Flows in Emerging Economies*, University of Chicago Press.
- Eniekezimene F. A. (2013). "The impact of foreign portfolio investment on capital market growth: evidence from Nigeria", *Global Business and Economic Research*, Vol 2, No 8
- Ernst and Young (2013). "Attractiveness Survey for Africa -Getting down to business", Available at [http://www.ey.com/Publication/vwLUAssets/Africa_Attract_2013_Getting_down_to_business/\\$FILE/Africa_attractiveness_2013_web.pdf](http://www.ey.com/Publication/vwLUAssets/Africa_Attract_2013_Getting_down_to_business/$FILE/Africa_attractiveness_2013_web.pdf)
- Feige E. L. (2003). "The Dynamics of Currency Substitution, Asset Substitution and Defacto Dollarization and Euroization in Transition Countries", *Proceedings 8th Dubrovnik Conference Volume on Monetary Policy and Currency Substitution in Emerging Markets*
- Feldstein M. and C. Horioka (1980). "Domestic Saving and International Capital Flows", *The Economic Journal*, Vol. 90, (June 1980), pp. 314-329
- Furceri D., G. Guichard and E. Rusticelli (2011a). "Medium-Term Determinants of International Investment Positions: the Role of Structural Policies", *OECD Economics Department Working Papers* No.863.
- Furceri D., G. Guichard and E. Rusticelli (2011b). "Episodes of large capital inflows and the likelihood of Banking and currency crises and sudden stops", *OECD Economics Department Working Papers* No. 865.
- Giannetti M. (2007). "Financial liberalization and banking crises: The role of capital inflows and lack of transparency", *Journal of Financial Intermediation*, 16 (1), 32 (63).
- Glick R. and M. Hutchison (2000). "Capital Controls and Exchange Rate Instability in Developing Economies", *Federal Reserve Bank of San Francisco Center for Pacific Basin Studies Working Paper* No. PB00-05 (December).
- Gourinchas P. O. (2012). "Global Imbalances and Global Liquidity", *Mimeo*, UC-Berkeley.
- Gross S. J. and L. Weiss (1983). "A transaction-based model of the monetary transmission mechanism", *American Economic Review*, Vol. 73, 981-880.
- International Monetary Fund (2008). *Regional Economic Outlook: Sub-Saharan Africa*, April.
- Jorda O., S. Moritz and T. M. Taylor (2011). "When credit bites back: leverage, business cycles, and crises", *Federal Reserve Bank of San Francisco Working Paper Series* 27.

- Kose M., Prasad E., Rogoff K. and Wei S. (2007). "Financial globalization: beyond the blame game", *Finance and Development* 44 (1).
- Kwack, Sung Yeung (2001). "An Empirical Assessment of Monetary Policy Responses to Capital Inflows in Asia before the Financial Crisis", *International Economic Journal, Taylor and Francis Journals*, Vol. 15(1), pages 95-113.
- Lane P. R. and G. M. Milesi-Ferretti, (2011). "The Cross-Country Incidence of the Global Crisis", *IMF Economic Review*, Vol. 59, No. 1, pp. 77-110.
- Lane P. R. and P. Mcquade, (2013). "International Capital Flows and Domestic Credit Growth", *IIS Discussion Paper No. 428*.
- Loana C. S. and A. C. Tiberiu (2009). "The Capital Flows Impact on the Stability of the Financial Systems", Available at <http://steconomice.uoradea.ro/anale/volume/2009/v3-finances-banks-and-accountancy/88.pdf>
- Luca O. and N. Spatafora (2012). "Capital Inflows, Financial Development, and Domestic Investment: Determinants and Inter-Relationships", *IMF Working Papers* 12/120, International Monetary Fund.
- Magud N., C. Reinhart and E. Vesperoni (2012). "Capital Inflows, Exchange Rate Flexibility, and Credit Booms", *IMF Working Paper* 12/41, (Washington: International Monetary Fund).
- McKinnon R. I. and H. Pill (1998). "International Overborrowing: A Decomposition of Credit and Currency Risks", *World Development Report*, Elsevier, vol. 26(7), pages 1267-1282, July.
- Mendoza E. and Terrones, M. (2008). "An Anatomy of Credit Booms: Evidence From Macro Aggregates and Micro Data", *Working paper* 08/226, International Monetary Fund.
- Obstfeld M. (2012a). "Financial Flows, Financial Crises, and Global Imbalances", *Journal of International Money and Finance* 31, 469-480.
- Obstfeld M. (2012b). "Does the Current Account Still Matter?", *American Economic Review*.
- Obstfeld M. and K. Rogoff (1996). *Foundations of International Macroeconomics*, MIT Press.
- Okpanachi, U. M. (2012). "An Assessment of Monetary Policy Response to Capital Inflows in Nigeria", *CBN Journal of Applied Statistics* Vol. 3 No. 2, pp. 75-98
- Ostry J. D, A. R, Ghosh, K Habermeier, L. Laeven, M, Channon, M.S Qureshi and A. Kokenye (2011). *Managing Capital Flows: What Tools to Use?*, *IMF Staff Discussion Note*.
- Prasad E. and R. Rajan (2008). "A Pragmatic Approach to Capital Account Liberalization", *Journal of Economic Perspectives*, Vol. 22, No3, pp. 149-72.
- Reinhart C. and V. Reinhart (2009). "Capital Flow Bonanzas: An Encompassing View of the Past and Present", In *NBER Macroeconomics Annual*, University of Chicago Press.

- Reinhardt D. and Dell'Erba (2013). Not all Capital waves are alike: A sector-level examination of surges in FDI Flows. Vox. A Research-based Policy Analysis and Commentary from Leading Economists.
- Rotenberg J. J. (1984). "A monetary equilibrium model with transactions costs", *Journal of Political Economy*, Vol.92, 40 - 58.
- Saidu F. (2013). "Capital Flows, Trade Openness and Economic Growth Dynamics: New Empirical Evidence from Nigerian Economy", Available at https://umsbe.wufoo.com/cabinet/m7z8a3/.../p159_update.pdf
- Shin H. S. (2012). "Global Banking Glut and Loan Risk Premium", *Proceedings of IMF annual Research Conference*, Mundell-Flemming.
- Spiegel M. (1995). "Sterilisation of capital inflows through the banking sector: evidence from Asia", *Economic Review* 3, Federal Reserve Bank of San Francisco.
- Stiglitz J. (2002). *Globalisation and its Discontents*, W. W. Norton & Co., New York.
- Yinusa D. O. and A. E. Akinlo (2008). "Exchange Rate Volatility and the Extent of Currency Substitution in Nigeria", *MPRA Publication*, Available at http://mpra.ub.unimuenchen.de/16257/1/MPRA_paper_16257.pdf