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Temitope Oshikoya[*]

Abstract

This paper considers the choice and trade-offs that Nigeria's economic policymakers face when deciding on the simultaneous combination of monetary policy, exchange rate management, and financial openness policies to adopt—the monetary policy trilemma. The paper finds empirical evidence of the monetary policy trilemma for Nigeria, implying that there is indeed a tradeoff among monetary independence, exchange rate stability, and financial integration. Monetary independence and capital control or openings were the main dominant factors throughout the sample period of 1970-2012. However, between 2000 and 2012, the sharp increase in financial integration created tension between monetary independence and exchange rate stability. The implications of changes in the trilemma indices for inflation were examined. Exchange rate stability, financial integration, and foreign reserves individually dampen inflation, when the objective of monetary independence is traded-off. A sample of global trilemma practices among developed countries, BRIC, MINT, SANE, and Oil producing countries was examined. Countries with very high reserve ratio to GDP of greater than 50.0 per cent, irrespective of their different exchange rate, monetary independence, and financial integration regimes, have navigated the trilemma very well. With low reserves to GDP ratio, Indonesia appears to have successfully navigated the economic policy trilemma by pursuing an intermediate regime. In Nigeria, the increase in foreign reserves has helped to mitigate the severity of the policy trilemma, especially when combined with exchange rate stability and financial integration objectives; the country has now been experiencing the corollary with the dwindling foreign reserves in 2013, 2014 and 2015. In short, in the face of multiple goals including macroeconomic stabilisation and financial stability in an economy with increased financial globalisation, fiscal slippages, external terms of trade shocks, financial market distortions, foreign capital famine, and low foreign reserves, monetary and exchange rate policy carry a bigger burden. Further research questions are raised. Should foreign reserves be used as gunpowder or nuclear weapon? How to cope with foreign capital feast and famine? The issue of foreign capital feast and famine becomes more relevant in the context of a financial trilemma, distinct from monetary trilemma. What are the costs and benefits of capital controls? When are capital controls useful and what types of capital controls are effective?

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I.   Introduction

One of the key challenges that economic policy makers in open economies face is how to simultaneously manage interest rates, exchange rates, and capital account openness—the policy trilemma; the unholy or impossible trinity. The trilemma of international economics and finance clearly suggests that only two of these three policies can be achieved simultaneously. Several studies have considered these issues from theoretical, empirical, and policy dimensions. Cross-country studies and single country experiences of China, Egypt, Greece, India, Malaysia, Poland and others have been undertaken in the literature on these issues.

The key insights from these studies can be summarised with the following quotations:
- **Policy Principles**: "One of the great immovable objects in open-economy macroeconomics is the impossible trinity or the policy trilemma" (Obstfeld et. al., 2005). "Governments face the policy trilemma – the rest is commentary". (Klein and Shambaugh, 2013).
- **Policy Trade-Off:** A key message of the trilemma is scarcity of policy instruments. In macroeconomic management, policy makers must face a trade-off of choosing two, not all, of the three policy choices: monetary independence, exchange rate stability, and financial openness. This is the famous hypothesis in international finance called the "trilemma" or the "impossible trinity", (Aizenman, 2011a). "You can't get all three. If you pick two of these goals, the inexorable logic of economics forces you to forgo the third". (Mankiw, 2010).
- **Policy Empirics:** Policy makers face a tradeoff, where increasing one trilemma variable (such as higher financial integration) would induce a drop in the weighted average of the other two variables (lower exchange rate stability, or lower monetary independence, or a combination of the two) (Aizenman, 2011a).
- **Policy History** has shown that different international financial systems have attempted to achieve combinations of two out of the three policy goals. For example, the Gold Standard system guaranteed capital mobility and exchange rate stability while the Breton Woods system provided monetary autonomy and exchange rate stability (Aizenman, 2011a). The Asian financial crisis was triggered by an attempt to achieve the three objectives simultaneously.
- **Policy and Shocks:** "The trilemma does not rule out common shocks that affect all economies, and monetary autonomy does not guarantee insulation from the world economy. Rather, an implication of the trilemma is that there is more scope for addressing shocks with monetary policy in a country with floating exchange rates – or with strong controls on international capital flows – than for a country with a pegged currency and open capital markets". (Klein and Shambaugh, 2013).
- **Policy Choice**: Looking at the diverse experiences of developing and emerging markets during over three decades, the actual choice of the trilemma configuration depends on the varying challenges and priorities facing an economy (Aizenman, 2011a).

- **Policy Quadrilemma**: The experience of emerging markets indicates that the trilemma triangle, while useful, overlooks the possibility that with limited but growing financial integration, countries hoarding international reserves may loosen, in the short-run, some of the trilemma constraints (Aizenman, 2011a).

This paper considers the choice and trade-offs that Nigeria's economic policymakers face when deciding on the simultaneous combination of monetary policy, exchange rate management, and financial openness policies to adopt—the policy trilemma. In section 2, the trilemma principles are outlined using the Mundell-Flemming Framework and its critiques, and the trilemma indices data set constructed for 170 countries by Aizenman et. al., (2014) are discussed. In section 3, we provide a descriptive nature of the evolution of the exchange rate management framework and policy trilemma indices for Nigeria from 1970 to 2012.

In section 4, we empirically find that the trilemma does exist for Nigeria, with the weighted sum of the indices adding up to a constant, and validating the notion that an increase in one trilemma objective variable implies a decrease or trade-off in another objective or two objectives. Monetary independence and capital control or openings were the main dominant factors throughout the sample period. However, between 2000 and 2012, the sharp increase in financial integration created tension between monetary independence and exchange rate stability. We analyse the implications of changes in the trilemma indices for inflation. The best empirical results are obtained when the objectives of exchange rate stability and financial integration, and loss of monetary independence are combined with increase in foreign reserves. Exchange rate stability, financial integration, and foreign reserves individually dampened inflation, when the objective of monetary independence is traded-off.

In section 5, a sample of global trilemma practices among developed countries, BRIC, MINT, SANE, and oil producing countries are examined. Countries with very high reserve ratio to GDP of greater than 50.0 per cent, irrespective of their different exchange rates, monetary policy, and financial integration regimes, have navigated the trilemma very well. With low reserves to GDP ratio, Indonesia appears to have successfully navigated the economic policy trilemma by pursuing an intermediate regime. In Nigeria, the increase in foreign reserves has helped to mitigate the severity of the policy trilemma, especially when combined with exchange rate stability and financial integration objectives; the country is now experiencing the corollary with the dwindling foreign reserves.   This section also concludes the paper and outlines issues for further research.

II.   Mundell-Fleming's Framework and the Trilemma Indices

II.1   The Mundell-Fleming Framework

What is the trilemma in open economies and international finance? It is rare to win a Nobel Prize in Economics: it is usually awarded for a major seminal contribution to the field. The

1999 Nobel Prize was awarded to Robert Mundell for his seminal and fundamental contribution to open-economy macroeconomics on the Impossible trinity or the Trilemma. This seminal contribution often regarded as the Mundell-Fleming Framework simply states that a country may simultaneously choose any two, but not all of the following three policy goals – monetary independence, exchange rate stability and financial integration (Aizenman, 2011a). Figure 1 depicts the "Trilemma triangle", with each of the three sides of the triangle showing desirable policy goals: monetary independence, exchange rate stability; and financial integration. However, no nation can be on all three sides of the triangle simultaneously.
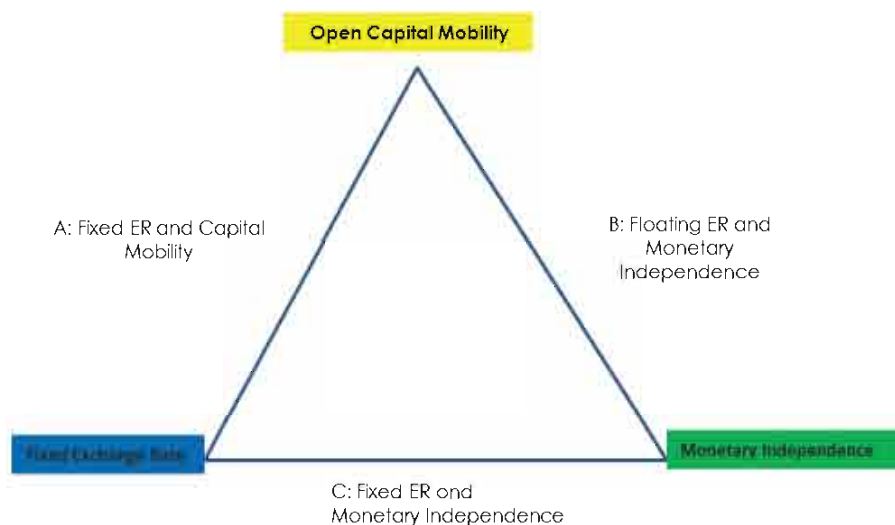
Figure 1: Trilemma Triangle
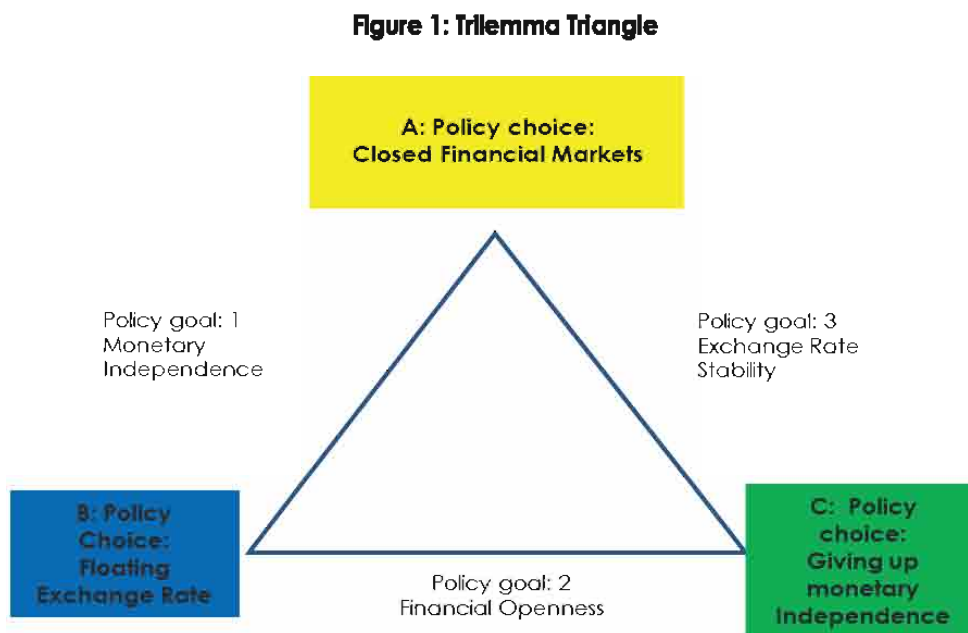
Mankiw (2010) provides a succinct and layman exposition of the trilemma stating that economic policy makers in most countries would like to achieve three goals as illustrated in Figure 2:

- First, make *the country's economy open to international flows of capital*. This capital mobility has the advantage of encouraging foreign investors to bring along resources and expertise into the country, while nationals can diversity their portfolio by investing abroad.
- Second, use *monetary policy as a tool to help stabilise the* economy. The central bank has the flexibility to adjust money supply and interest rates depending on the conditions of the economy.
- Third, *maintain exchange rate stability by preventing exchange rate volatility, especially driven by speculation,* can destobilise the economy and prevent

forward planning by businesses and households. Unfortunately, policy makers cannot pick all three simultaneously.

Economic logic dictates a trade-off of one, if choices are made about two of these goals at the same time. To illustrate with the major economies and country experiences, in Figure 1, China is at the top vertex, point A, with "closed financial markets," representing a combination of monetary independence and mostly a fixed exchange rate regime. China has a preference for monetary independence and exchange rate stability: first and third goals. However, in order to accomplish these two goals, the Chinese Authorities restrict capital mobility, without which money would flow into and out of the country, forcing the domestic interest rate to match foreign interest rates.

Figure 2: Goals to be achieved

Open Capital Mobility

A: Fixed ER and Capital Mobility

B: Floating ER and Monetary Independence

Fixed Exchange Rate

Monetary Independence

C: Fixed ER and Monetary Independence

The United States is at the left vertex, Point B with "floating exchange rate regime", which is a combination of monetary independence and financial openness or integration. The United States has picked monetary independence and capital openness, the first and second goals, resulting in trade-off of the third goal of exchange rate stability. The Federal Reserves can conduct independent monetary policy, while Americans and foreigners can move funds in and out freely, at the prevailing exchange rates determined by the market. The countries of the European Union (for example, France, Germany, and Greece) are at Point C, the right vertex, which is associated with giving up monetary independence through a Currency Union, ensuring a combination of exchange rate stability via a pegged exchange rate regime, and financial openness or integration. The member

countries of the European Union agreed to the second and third goals, by trading-off independent national monetary policy. These countries used the Euro to replace their national currencies, eliminating all exchange rate movements within the zone, while capital is free to move among nations.

Mundell's Trilemma framework can be viewed in the context of an open economy extension of the IS-LM Neo-Keynesian model, which focuses on a small country selecting its exchange rate regime and its financial integration with the global financial market. The model is simplified with a focus on polarised binary choices, i.e., credibly fixed exchange rate or pure float, and prefect capital mobility or financial autarky (Aizenman, 2011a). Most macroeconomics, international economics, and monetary economics textbooks provide illustration of the models and its policy implications. Several other studies have been done in recent times on the issues raised by the Mundell's Trilemma framework. Some of these studies include Edison et. al., 2002; Shambaugh, 2004; Obstfeld et. al., 2005, 2009, 2010; Henry, 2006; Popper et. al., 2011; Aizenman et. al., 2008b, 2011a; Aizenman, 2011; Aizenman and Ito, 2012; Hutchinson et. al., 2010; Kohli, 2011; Hsing, 2012, 2013; Sengupta and Sengupta, 2013; Chetwin and Munro, 2013; Obstfeld, 2014; Rummel, 2014; Klein and Shambaugh, 2014; and others).

II.2   Dilemma with the Trilemma
Foreign Capital Feast and Famine

Some have argued that the policy tilemma paradigm is too restrictive of the real world. While the insights from the model are well established among academic economists and shared by practitioners and policymakers, most countries rarely face the binary choices articulated by the trilemma. Instead, countries choose the degree of financial integration, with varying degree of capital flows restrictions, and exchange rate flexibility, with managed floating now more prevalent, especially in developing countries. In essence, policy makers can "round the corners" of the policy trilemma triangle with intermediate policies including softly pegged exchange rates, managed floating exchange rates, temporary, narrowly targeted capital controls (Klien and Shambaugh, 2013). Understanding these mixed regimes remains a challenge.

Others insist that the policy trilemma seems to give too much credit to the ability of central banks to manage an economy. Rey (2013a, 2013b) observes that financial globalisation has rendered obsolete the policy trilemma paradigm, with policy makers now facing instead a dilemma, or an "irreconcilable duo": implying that free capital flows inevitably leads to a loss of monetary autonomy. In essence, monetary policy independence is possible if and only if the capital account is managed. Rey points out the correlation among prices of equity and bonds risky assets with capital flows and credit growth and market volatility of US S&P 500 index options (VIX). These movements in global financial cycle also linked to US monetary policy suggests that central bankers sitting in one corner

of the world cannot easily lean against a barrage of investment coming from another corner (The Economist, August, 2013).

There have been responses to these arguments, showing that the policy trilemma framework, especially its implied trade-offs, is still valid. Klein and Shambaugh, (2013) note that the trilemma is alive and well and find evidence that first, exchange rate flexibility is associated with greater monetary-policy autonomy, so there is some rounding of that corner of the policy trilemma; second temporary, narrowly targeted capital controls do not enable a country with a fixed exchange rate to have greater monetary-policy autonomy than it has under full capital mobility; and thirdly, widely applied, longstanding capital controls break the link between domestic and foreign interest rates under a fixed exchange rate system. They also note that the issue raised by Rey is that of interdependence or contagion, which is distinct from whether exchange rate regimes affect monetary policy independence. While the credit channels by Rey is important for macroeconomic performance, monetary policy also impacts macroeconomic outcomes via the interest rates and exchange rates channels.

Klein and Shambaugh, (2013) conclude that "the trilemma does not rule out common shocks that affect all economies, and monetary autonomy does not guarantee insulation from the world economy. Rather, an implication of the trilemma is that there is more scope for addressing shocks with monetary policy in a country with floating exchange rates – or with strong controls on international capital flows – than for a country with a pegged currency and open capital markets." While financial cycles and large country interest rates, such as the US, do impact other economies, the degree of floating of the exchange rates or capital market integration determines the degree of freedom over how to respond to these shocks. In terms of policy debate surrounding the expected tapering of accommodative monetary policy by the Fed, Klein and Shambaugh (2013) note that emerging markets with floating exchange rates can either choose to depreciate their currencies, raise domestic interest rates, or some combination of the two.

Overall, capital inflow and its sudden reversal can lead to financial vulnerabilities and dislocations as witnessed among emerging markets in the 1990s, especially the Tequila crisis of two decades ago. Calvo et. al., (1996) observed that countries that implemented a comprehensive policy package and not relied on a single instrument have been the most successful in managing capital flows. On the other hand, Obstfeld (2014) notes that, "a less productive policy mix has consisted of persistent sterilisation (which keeps short-term interest rates comparatively high), heavy intervention in the foreign exchange market (which results in little short-run exchange rate uncertainty), and no controls on short-term capital movements". All of these policies have tended to provide especially wrong incentives for short-term capital inflows. A big sell-off of domestic assets by foreign investors is likely to induce a significant exchange rate change before enough buyers come forward to restore market equilibrium." Does that sound familiar in the Nigerian context with what has been observed in the past ten years, especially between 2010 and 2015?

II.3   From the Trilemma to Policy Quadrilemma
Foreign reserves: gunpowder or nuclear weapons?

Large holdings of foreign reserves tend to serve to relax the policy trilemma constraints, which suggest a fourth dimension of policy quadrilemma. The experience of emerging markets indicates that the Trilemma triangle, while useful, overlooks the possibility that with limited but growing financial integration, countries hoarding international reserves may loosen in the short-run some of the trilemma constraints (Aizenman, 2011). Three key factors have been associated with the growing trend in reserve hoarding by Obstfeld, Shambaugh, and Taylor (2009). First is the fear of floating factor, as efforts are made by policy makers to stabilise the exchange rate in order to grow trade, to minimise the impacts of dollarisation, and to provide nominal anchor for inflationary expectations. Second is the attempt to promote financial intermediation through the domestic banking system. Third factor relates to increase in financial integration with the global financial markets. These three factors increased the transmission of shocks from the global financial markets into the domestic economy.

Bussière et. al., (2014) raises another set of questions relating to whether foreign reserves are gun powder or nuclear weapons. If foreign reserves are 'gunpowder', then they have to be deployed during a war (crisis); while if they are 'nuclear weapons,' then they serve as deterrents as the mere existence of reserves serves as a form of protection. Aizenman and Sun (2009) look at reserve depletion and its impact on economic growth of the same period; much like using reserves as gun powder. On the other hand, Bussière et. al., (2014) show that foreign reserve adequacy relative to short-term debt contributes, on its own or jointly with capital controls, to real output growth during the recent global financial crisis; much like using reserves as nuclear weapon. Bussière et. al., (2014) also show the stabilising impacts of foreign reserves and capital control measures, while presenting evidence of more reserves accumulation and capital controls by developing countries relative to advanced economies.

Popper et. al., (2011) find that trilemma policy stability is linked to large official holdings of foreign reserves in low-income countries that are characterised by relatively fixed exchange rates and relatively closed capital markets. Popper et.al., (2011) also find that the combination of fixed exchange rates and financial market openness is a more stable arrangement within the trilemma; and that middle-income countries have less stable trilemma arrangements than either low or high-income countries.

On the other hand, Aizenman and Ito (2012) empirical evidence cast doubt on the optimality of open capital accounts and floating exchange rates. They find that countries occupying the middle ground of the policy trilemma (flexible managed exchange rates, intermediate levels of monetary policy and widespread, but incomplete, capital account restrictions) experienced lower output volatility than other countries in the past two decades. The IMF now seems to support this middle ground approach.

II.4   Financial Trilemma and Monetary Trilemma

While the monetary trilemma is well established both in the academic literature and the policy circles, the global financial crisis of 2007 and 2009 highlights the importance of managing financial stability and underscores the financial trilemma phenomenon. In Nigeria, this issue came to the forefront with the efforts of the Central Bank of Nigeria (CBN) under Sanusi Lamido Sanusi to manage financial crisis and restore financial stability. Schoenmaker (2011) provides an insight into the financial trilemma in Figure 3, which suggests that financial stability, financial integration, and national financial policies are incompatible. Any two of the three objectives can be combined but not all three: one has to give way. When Figures 1, 2, and 3 are viewed together, the main link between monetary trilemma and financial trilemma is financial integration or degree of capital mobility or controls.

Figure 3: Financial Trilemma

A: Financial Stability

B: Financial Integration   C: National Financial Policies
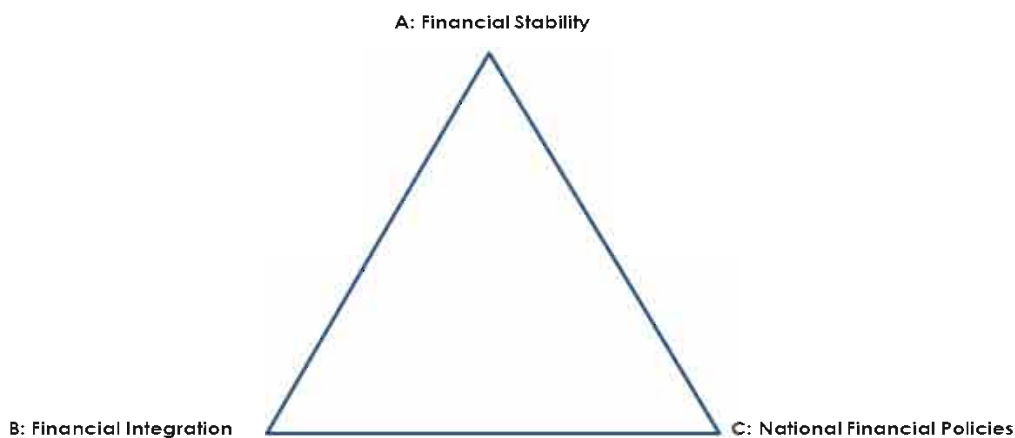
The combination of monetary trilemma and financial trilemma poses more difficult trade off among multiple policy objectives: inflation targeting, output stabilisation, and financial stability in the face of financial globalisation and domestic policy instruments shortages for simultaneously attaining these objectives. Obstfeld (2014) examines this particular issue for emerging market economies and notes that while potentially a potent source of economic benefits, financial globalisation has its own downside for economic management as it worsens the trade-offs monetary policy faces in navigating among multiple domestic objectives. With financial globalisation, the potency of national macro-prudential policies are constrained by the existence of the financial trilemma, that is distinct from the monetary trilemma, and which shows the incompatibility of national

responsibility for financial policy, international financial integration and financial stability. In essence, macro- prudential policies are rendered ineffective by the financial trilemma with capital mobility.

In short, in the face of multiple goals including macroeconomic stabilisation and financial stability in an economy with increased financial globalisation; fiscal slippages, external terms of trade shocks, financial market distortions, and foreign capital famine, as well as low foreign reserves, monetary policy carry a bigger burden.

II.5   The Trilemma Indices

It is quite challenging to empirically test the insights from the Trilemma framework with no unique definition and measurement of the degree of exchange rate flexibility, monetary independence, and financial integration. However, Aizenman et. al., (2010, 2014) have made important contributions to this effort with the construction of the trilemma indices for 170 countries, including Nigeria. The trilemma indices quantify the degree of achievement along the three dimensions of the "trilemma" hypothesis: monetary independence, exchange rate stability, and financial openness, and available for more than 170 countries. These indices are first introduced in Aizenman, Chinn, and Ito (ACI, 2008b), and have been regularly updated. The dataset is available in both Excel and STATA format at http://web.pdx.edu/~ito/trilemma_indexes.htm. This sub-section draws mainly from the Note on the Trilemma Measures, with more details in (ACI, 2010). ACI defines the trilemma measures as follows.

Monetary Independence (MI): The extent of monetary independence is measured as the reciprocal of the annual correlation between the monthly interest rates of the home country and the base country. Money market rates are used for the calculation. By construction, the maximum value is 1, and the minimum value is 0. Higher values of the index indicates more monetary policy independence. The formula assigns MI value of 0.5 for use of other policy tools such as CRR and other monetary controls.

Exchange Rate Stability (ERS): To measure exchange rate stability, annual standard deviations of the monthly exchange rate between the home country and the base country are calculated and included in the formula to normalise the index between 0 and 1. Higher values of this index indicate more stable movement of the exchange rate against the currency of the base country.

Financial Openness/Integration (FOI): *De jure* index of capital account openness, reflecting the policy intentions of the countries. FOI is based on information regarding restrictions in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions*. FOI is the first standardised principal component of the variables that indicate the presence of multiple exchange rates, restrictions on current account transactions, on capital account transactions, and the requirement of the surrender of export proceeds.

The index is normalised between zero and one. Higher values of FOI indicate that a country is more open to cross-border capital transactions.

III.   Nigeria's Policy Trilemma and Quadrilemma

According to the Central Bank of Nigeria (2014, 2009), the main objectives of exchange rate policy in Nigeria are to preserve the value of the domestic currency, maintain favourably external reserves position and ensure external balance without compromising the need for internal balance and the overall goal of macroeconomic stability. In this section, we examine the evolution of the trilemma indices in the context of the exchange rate, interest rate, and capital controls management framework in Nigeria. We also add the foreign reserves management to extend the policy trilemma to policy quadrilemma. The descriptive analysis of the trilemma indices is complemented with actual developments based on materials on the subject obtained from the website and publications of the CBN including the book: CBN (2009) "50 Years of Central banking in Nigeria: 1958-2008."

Figure 4-8 present Nigeria's trilemma and quadrilemma indices for the period 1970-2012; and further divided into three periods: 1970-85, 1986-99, and 2000-2012. In addition, to facilitate the discussion of the evolution of the indices and the principal factors behind them, the figures include the trilemma by Governors' regimes.

Figure 4: Nigeria's Trilemma Indices: 1970-2012
Exchange Rate Stability, Monetary Independence & Financial Openness
Isong (1-6); Vincent (8-12); Ahmed1 (13-18); Ahmed2 (19-24);
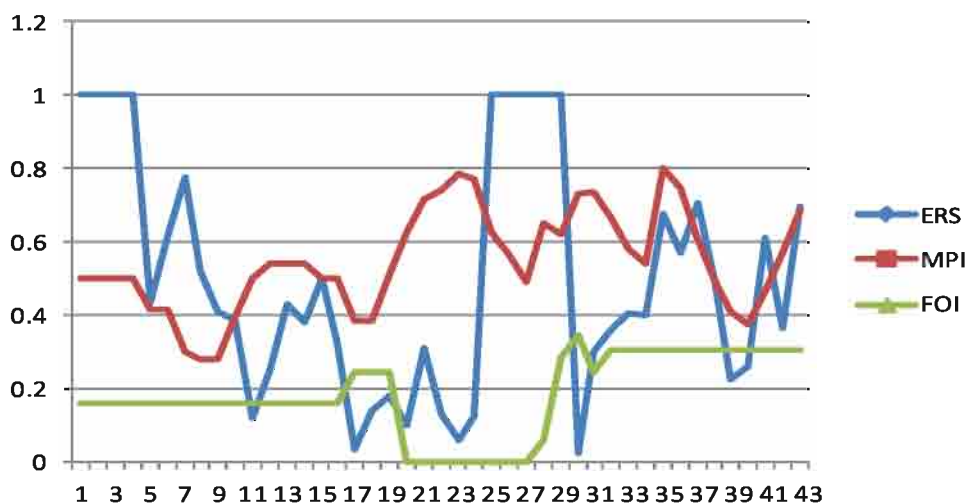**Ogwuma (25-29); JSanusi (30-34); Soludo (35-39); Lamido (40-43)**

Table 1: Trilemma indices for Nigeria: 1970-2012

		1970-2012		1970-1985		1986-1999		2000-2012	
Means	**ERS**	0.50185		0.57227		0.43637		0.468512	
	MI	0.5465		0.45068		0.61545		0.590244	
	FOI	0.18452		0.161549		0.101928		0.301752	
Coefficients	**ERS**	0.54883		0		0.337899		-0.32469	
	MI	2.44998		0		2.663836		0.571037	
	FOI	1.686743		12.38011		1.602091		6.004249	
R-Squared		0.963		1		0.975		0.998	
Contributions	**ERS**	0.2754	14%	0	0%	0.1474	7.6%	-0.1521	-8%
	MI	1.3389	70%	0	0%	1.6395	84%	0.3371	17%
	FOI	0.3112	16%	2	100%	0.1633	8.4%	1.8118	91%
Total		1.9255	100%	2	100%	1.95	100%	2	100%

Table 2: Contributions to the Trilemma: Nigeria's Policy Trilemma

<u>**1970-2012**</u> • MI with high policy weights throughout. Tension between FOI and ERS.	• **Monetary Independence (70%)** • Exchange Rate Stability (14%) • Capital Mobility (16%)
<u>**1970-1985**</u> • High Administrative control • Main goal was ERS, MI is lost • Closed capital mobility used to achieve ERS.	• **Closed Capital Mobility (100%)** • Exchange Rate Stability (0%) • Monetary Independence (0%)
<u>**1986-1999**</u> • MI is asserted • ERS is lost • FOI wanes	• **Monetary Independence (84%)** • Exchange Rate Stability (7.6%) • Capital Mobility (8.4%)
<u>**2000-2012**</u> • Open FOI increased along with the use of FXR	• **Open Capital Mobility (91%)** • Exchange Rate Stability (-8%) • Monetary Independence (17%)

• Balance between MI and ERS • Tension between FOI and ERS	

III.1   1960-1985: Top Point A: Closed Capital Mobility, Fixed Exchange Rate and Stability; and Intermediate Monetary Independence

Overall, during this period, there was essentially closed capital mobility, fixed exchange rate and stability, and intermediate degree of monetary independence with direct controls, which corresponds to the vertex, point A, with "closed financial markets," in Figure 1. Following the creation of the CBN in 1958 and the passing of the Exchange Control Act of 1962, foreign exchange earnings, mainly from agricultural exports, were deposited and centralised with the CBN (2014). During the 1960s and up to 1974, the monetary policy framework was exchange rate targeting, in line with a fixed exchange rate regime, with the Nigerian currency fixed at par, first with the British pound sterling, and subsequently, with a basket of 7 currencies (CBN, 2009). However, in 1974, the CBN adopted monetary targeting framework following the collapse of the Breton Woods system of the fixed exchange rate regime in the early 1970s. Monetary policy instruments were in the form of direct controls, and exchange controls were administered with import licensing regime.

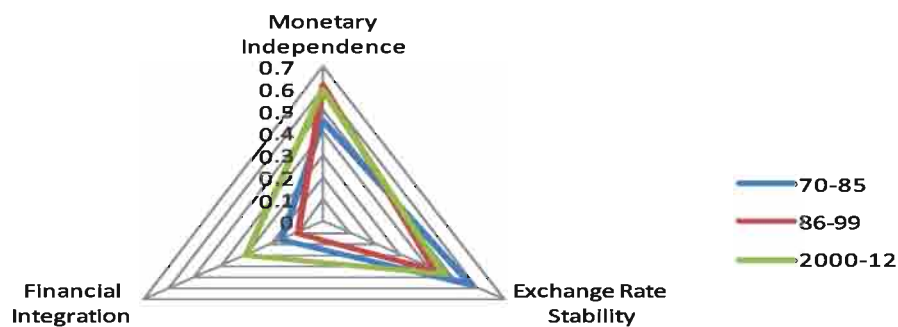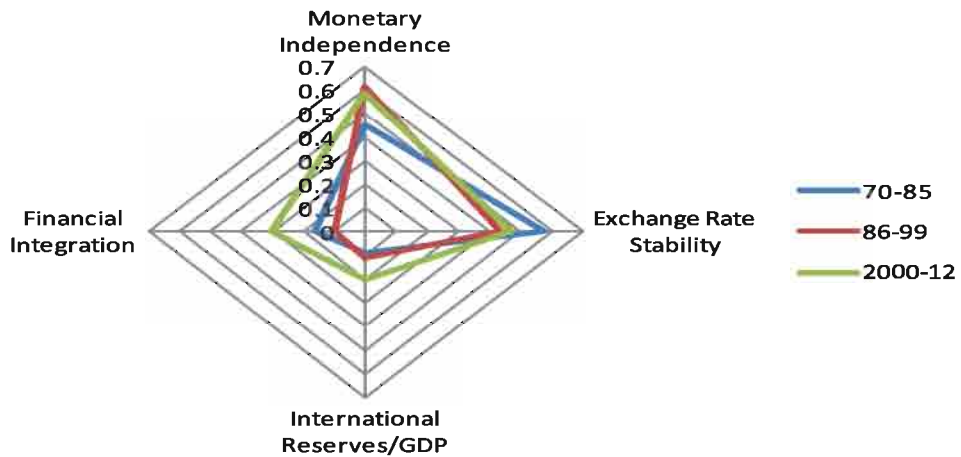### Figure 5: Nigeria's Policy Trilemma

Figure 6: Nigeria's Policy Quadrilemma: Trilemma and Reserve Accumulation

At that time, Nigeria had a preference for first and third goals: monetary independence and exchange rate stability. However, in order to accomplish these two goals, the Monetary Authorities in Nigeria restricted capital mobility. These choice and trade-offs are reflected in the blue line for Isong in the diamond graph Figure 7 where ERS index was close to 1 at an average of 0.85, FOI index close to zero, at 0.161, and MI was in the middle range at 0.472. During the Isong's regime, foreign reserves as a ratio of GDP was quite low at 3.0 per cent, up to 1973; and then shot up to 23.0 per cent in 1974-1975 as rising foreign exchange inflows resulted from increased crude oil prices and exports. Inflation rates averaged 14.0 per cent, with the lowest point at 3.5 per cent in 1972 and the highest point at 34.0 per cent in 1975.

Figure 7: Trilemma by Governors' Regime
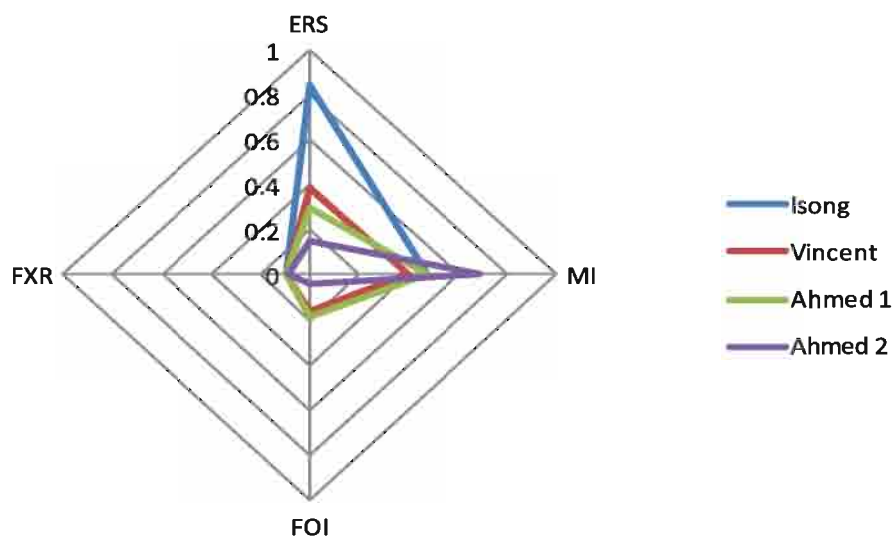
The CBN under Governor Ola Vincent continued mainly with the regime of near closed capital mobility with FOI index still at 0.161. On the other hand, as shown in the red line in the diamond graph of Figure 7, the exchange rate stability (ERS) index declined by more than half to 0.38; while the monetary independence (MI) index also declined from 0.48 to 0.40. Although monetary policy instruments were also in the form of direct controls, and exchange controls were also administered with import licensing regime and foreign exchange rationing during this period, both exchange rate stability and monetary independence lost ground as foreign exchange reserves to GDP ratio declined from 23.0 in 1974 to 6.0 per cent in 1978. It picked to 17.0 per cent in 1980 before sliding to 7.0 per cent in 1981, although absolute foreign reserves increased from US$220 million in 1970 to US$10.6 billion in 1980, by end-1981 it stood at US$4 billion. Inflation rates averaged 16.0 per cent during Vincent's period, with the lowest point at 10.0 per cent in 1980 and the highest point at 21.0 per cent in 1981 when the GDP growth rate actually declined by 13.0 per cent following the slide in oil prices.

For analytical purpose, the period described here as the first term of Ahmed, not the legal term, witnessed from 1982 more comprehensive exchange controls including prescriptions of eligible transactions and parallel foreign exchange market begun to flourish. Monetary policy instruments remained largely that of direct controls, but it was heightened to fight inflation which was brought down from an average of 16.0 per cent earlier to 12.0 per cent, the lowest at 5.7 per cent in 1986 and the highest at 23.0 per cent in 1983. The GDP growth rate contracted during this period at an average negative rate of 3.2 per cent; and a significant decline of 11.0 per cent in 1987. The foreign exchange reserves fell from a high of US$10.6 billion in 1980 to US$1.5 billion in 1987; with reserves to GDP ratio at an average of 5.0 per cent.

III.2   1986-2014: Left Point B: More Open Capital Mobility, Less Exchange Rate Stability, and More Monetary Independence

From 1985-86, several structural breaks as part of structural adjustment program (SAP) in respect of exchange rate management were witnessed. In 1985, a "one currency intervention system in the form of the US Dollar was adopted. A flexible exchange rate regime was adopted in 1986, with a dual exchange rate system emerging. Under the Second-tier Foreign Exchange Market (SFEM), official transactions were carried out at the fixed pre-SFEM rate, while transactions from the private sector were sourced at the market-based rate. In July 1987, both rates were merged into a single system, CBN (2009)".

Overall, exchange rate stability was lost with ERS index now at 0.14 in1987, the lowest, while monetary independence (MI) index moved back towards 0.47 and the capital control was relaxed by 1987 with the FOI index increasing to 0.24.   There was a considerable movement away from Point A in the triangle Figure 1 towards Point B, as the choice of regained more monetary independence and foreign exchange flexibility led to a trade-off in exchange rate stability.

From 1989 to 1996, corresponding to the second term of Ahmed and the regime of Paul Ogwuma, FOI was reduced to zero as more capital controls were instituted. In 1989, several Bureau-de-Change operators were licensed to provide access for small users of foreign exchange. From 1993, monetary policy instruments shifted from direct controls to indirect controls and market-based instruments were introduced including interest rate policy, reserve requirement, discount window operations, and open market operations (CBN, 2009). Several experiments were made with foreign exchange market including the Dutch auction system, unified exchange rate system, autonomous foreign exchange market, inter-bank foreign exchange market, deregulated exchange rate system, and wholesale Dutch auction system.

Between 1994 and 1998 which was during Ogwuma's regime, the official exchange rate was fixed. As a result, ERS moved back to 1 same as during the early part of Isong's regime, MI averaged 0.6, while FOI was 0.05, with more restrictions on capital mobility. Inflation was high at an annual average rate of 35.5 per cent, in the same range similar to the second regime of Ahmed, and a high of 73.0 per cent in 1995. Although Ogwuma inherited a foreign reserves-GDP ratio of 9.0 per cent in 1994, the ratio improved to 23.0 per cent by 1998 as foreign reserves increased from US$1.65 billion to US$7.3 billion in the same period.

Joseph Sanusi's regime from 1999-2003 was characterised by attempts to improve on financial integration with FOI increasing to 0.3 compared to 0.07 under Ogwuma and 0.04 under Ahmed II, exchange flexibility as the ERS indicator declined from 1 in 1998 to an average of 0.3, and a high degree of monetary independence with MI at 0.65 in Figure 8. Indeed, it can be said that Joseph Sanusi was trying to round the corners of the triangle by moving towards the middle ground, even with a reserve-GDP ratio of 17.0 per cent on average and an inflation rate of 12.0 per cent, three times lower than under Ogwuma and Ahmed.

Figure 8: Trilemma by Governors' Regime
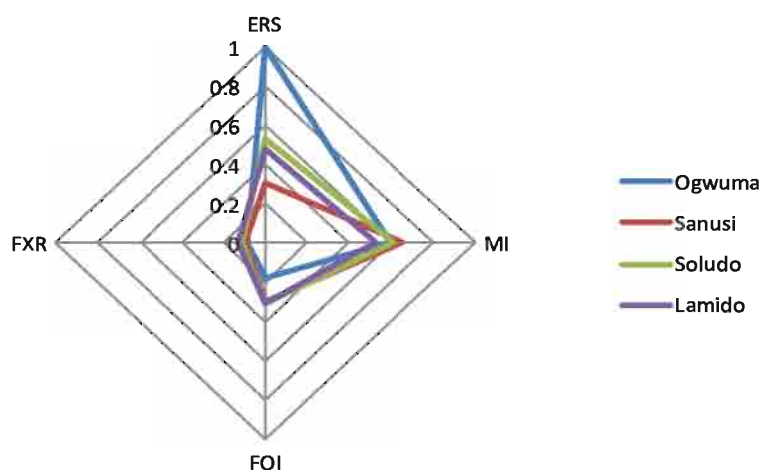
In 2004, under Charles Soludo, while maintaining the same level of capital control with FOI at 0.30, initially tried to increase monetary independence with the MI at 0.8, the highest throughout the 50 years period, and exchange rate stability with ERS of 0.68. But by the end of his tenure, both monetary independence and exchange rate stability have been lost as the MI and ERS now registered 0.41 and 0.226 respectively in 2008. Monetary policy instruments became more market-based and inflation targeting was introduced in 2007. The success of the rDAS, the rise in the external reserves position, fiscal discipline, and the banking consolidation exercise encouraged the transition from rDAS to wDAS in 2006 as the mechanism for exchange rate determination (CBN, 2009). The highest period of reserves to GDP ratio was recorded under Soludo at 31.0 per cent in 2007, while inflation rates averaged 11.8 per cent.

From 2010, following the banking restructuring exercise, Sanusi Lamido Sanusi tried to focus attention towards gaining more exchange rate stability and monetary independence with the ERS at 0.7 and MI at 0.69 by 2012, while maintaining about the same degree of capital mobility at 0.3, much the same as during Joseph Sanusi and Charles Soludo. Sanusi Lamido Sanusi also pursued inflation targeting, with an average inflation rate of 12.0 per cent between 2009 and 2012. The foreign reserves to GDP ratio, however, declined from 27.0 per cent in 2009 to 10.0 per cent in 2012 due to low accretion and the re-based GDP. As noted earlier, this period was characterised by policies that tended to provide wrong incentives for short-term capital inflows with persistent sterilisation, which keeps short-term monetary policy rates (MPR) comparatively high among emerging markets economies, heavy intervention in the foreign exchange market to maintain exchange rate stability, and with relatively low controls on short-term capital movements. In 2013 and 2014, the big sell-off of Nigerian domestic assets by foreign investors induced a significant downward pressure on exchange rate change.

Table 3: Trilemma by Governors' Regime

			Priority			Explanation
1970-1993		**INF%**	**1**	**2**	**3**	
1970-1975	Isong	14.2	ERS	MI	FOI	ERS key objective; MI second priority; Closed FOI
1977-1981	Vincent	15.9	MI	ERS	FOI	Loss of MI and ERS; Closed FOI
1982-1987	Ahmed1	12.2	MI	ERS	FOI	Regained MI; Loss ERS; Slight Opening of FOI
1988-1993	Ahmed2	37.9	MI	ERS	FOI	Strengthened MI; Lost ERS and Stringent FOI
1994-2012		**INF%**	**1**	**2**	**3**	
1994-1998	Ogwuma	35.5	ERS	MI	FOI	ERS main objective; MI reduced; FOI maintained
1999-2003	Sanusi	11.9	MI	FOI	ERS	Regained MI; Increased FOI; Reduced ERS
2004-2008	Soludo	11.6	MI	ERS	FOI	MI declined slightly; ERS and FOI increased
2009-2012	Lamido	12.0	MI	ERS	FOI	MI and ERS lower; FOI increased
Highest and Lowest Inflation in recent years						
1995	**Ogwuma**	**72.8**	**1**	**0.56778**	**0**	**Closed FOI and tension between ERS and MI**
2007	**Soludo**	**5.4**	**0.48797**	**0.49266**	**0.24430**	**Intermediate regime approximated**

III.3   2020 Onwards: Top Point C: Open Capital Mobility, Exchange Rate Stability, Loss of Monetary Independence

As Nigeria prepares to join the West African Monetary Zone (WAMZ) and single currency arrangement in 2020, it would have completed the movement from Point A (1960-1985) through Point B (1986-2019) to Point C (2020 onwards), which will correspond to loss of monetary independence, more capital mobility within the Zone, and exchange stability.

Mundell (1961) also provides the relevant theory using the optimal currency area (OCA) for analysing the central conditions for an ideal monetary union. The OCA is considered the optimal geographical area of a common currency, or of several currencies, whose exchange rates are irrevocably pegged. Three main OCA criteria are factor mobility, degree of economic openness, and diversification of production and consumption. Nigeria is the dominant economy in the WAMZ, accounting for over 80.0 per cent of the population, and 90.0 per cent of the Zone's GDP. The issues of asymmetric shocks arising from the fact that oil contributes over 80.0 per cent of total revenue and 90.0 per cent of

foreign exchange earnings have been of concern for other WAMZ countries (Oshikoya, 2010). In view of these facts, developments relating to the economy of Nigeria will likely dictate the pace of monetary and exchange rate policy and may look like the country, as the centre, is still at point B, although monetary policy will be set by supra-national body, while the other countries, as the periphery, will be at point C.

IV.   Empirical Analysis and Results

IV.1   Empirical Results: Trilemma Policy Stance

This sub-section empirically examines Nigeria's trilemma policy stance using the annual indices provided by ACI. First, Table 1 reports the means of the three indices for the periods 1970-2012, 1970-1985, 1986-1999 and 2000-2012. The entire sample period, 1970-2012 considered; overall, monetary independence has a higher mean value follow by exchange rate stability, and capital mobility, a distant third. The first sub-period focuses on the period when the central bank maintained essentially a fixed exchange rate and closed capital mobility. The second sub-period captures the structural break from 1986, when the pegged exchange rate was abandoned. The third sub-period was meant to cover the democratic dispensation. With these measures, exchange rate stability was relatively high in the first period, then fell in the second period, but gained marginally in the third period. Monetary independence increased from the first period to the second period, but declined modestly in the third period. Capital mobility declined from the first period to the second period, but then tripled in the third period.

As noted, The trilemma triangle represents a binding trade-off between three policy objectives. Accordingly, the methodology of the trilemma estimation is based on the principle that an increase in any one of the three indices must be balanced by a decrease in one or two of the other indices; thus ensuring that there is a binding constraint. All three indices cannot simultaneously reach their maximum values, but policymakers can experiment with a combination of the three policy goals. In this context, the index with the higher value would indicate the desirable policy goal that the central bank would like to focus on. Following the approach by ACI (2008), a simple functional form is adopted where a constant value of 2, the dependent variable is regressed on the three indices at the same time. The usual constant term is omitted on the right hand side of the equation as follows:

$$2 = aMIt + bERSt + cFOIt + Ut \qquad\qquad (1)$$

Table 1 provides an explanation of the contribution of each trilemma indices. First, it is observed that the R-squared numbers are very high ranging from 0.97 to 1; a high regression goodness of fit clearly indicates that the linear model specification has provided an explanation of the trade-off facing the Central Bank of Nigeria among the three policy goals. The preferences attach to each policy goals can be measured by the estimated coefficients in equation 1; all three indices are consistently and statistically significant in all

the regressions. But there are variations across periods. Furthermore, the contribution of each policy goal is obtained by multiplying the mean value with the estimated coefficients for each variable in each period. The findings are interpreted by periods:

- For the entire period of 1970-2012, monetary independence dominated with high statistical value and a 70.0 per cent contribution weight of the total. Thus, according to Figure 10, for the whole period, monetary independence was given more importance, with both exchange rate stability (14.0 per cent) and capital mobility (16.0 per cent) providing about the same share of the total.
- In the first sub-period of 1970-1985, closed capital control was the dominant policy objective in line with the findings in section 2, where the country was at point A. Indeed, closed capital mobility significantly outweighs, with contributions of 100.0 per cent to the total, both monetary independence and exchange rate stability.
- For the second sub-period of 1986-1999, monetary independence regained upper hand with 84.0 per cent contributions, while both exchange rate stability (7.6 per cent) and capital mobility (8.4 per cent) made modest contributions. Monetary independence was re-asserted as exchange rate stability is lost and capital mobility wanes.
- For the third sub-period of 2000-2012, capital mobility, with a 91.0 per cent share, became once again a dominant factor after falling between 1970-1985 sub-periods and 1986-1999 sub periods. This result is consistent with the observation in section 2, where it was indicated that due to more open capital mobility, the index tripled during Joseph Sanusi, Soludo and Lamido Sanusi era compared to Paul Ogwuma and Abdulkadri Ahmed era. However, exchange rate stability suffered significantly providing negative contribution (-8.0 per cent), while monetary independence contributed 17.0 per cent.

Going by the size of the estimated coefficients and the share of contributions of the indices, monetary independence and capital mobility have been given more policy weights relative to exchange rate stabilisation objective. It appears that exchange rate stabilisation comes out more as residual goal both in the period from 1970-1985 when the country was at Point A with closed capital mobility and in the period 1986-1999 when more flexible exchange rate regime and open capital mobility were instituted. However, between the period 2000 -2012, the sharp increases in financial integration created tension between monetary independence and exchange rate stability. The story that emerges from these empirical results is that monetary independence and capital control or openings have been the most dominant throughout the sample period of 1970-2012, while exchange rate stability goal is simply a residual in the background.

IV.2   Empirical Results: The Trilemma, Inflation and Reserves

In addition to maintaining external exchange rate stability of the naira, one of the principal goals of the Central Bank of Nigeria is to maintain domestic price stability, measured as the

year on year inflation. In this sub-section, we empirically examine the impacts on inflation of the trilemma policy stance and their interaction with the reserve ratio. In essence, how has the policy choices affect inflation during the sample period.

Following (ACI (2008, 2009, and 2010), Hutchinson, et.al (2010), and Aizenman and Sengupta (2011), the model is etimated:

$$y_t = d_0 + d_1 TLM_t + d_2 FXR_t + d_3 (TLM_t * FXR_t) + V_t \qquad\qquad (2)$$

where, y_t is a measure for YoY inflation calculated using annual data in year t. TLM_t is a vector of any two of the three trilemma policy indices, namely, *MI, ERS, and FOI. FXR_t,* is the level of international reserves as a ratio to GDP., and finally ($TLM_t * FXR_t$) is an interaction term between the trilemma policy indices and the FXR. The significance of the interaction terms is that it identifies whether foreign reserve accumulation complement or act as a substitute for other policy stances. In accordance with Aizenman and Sengupta (2011), which undertake a similar study for China and India, the objective is to analyse the impact of the evolving trilemma choices on domestic inflation in Nigeria and to find out the impacts of foreign reserves accumulation on this macroeconomic policy dynamics. In essence, to what extent have reserves hoardings being used to soften the policy trilemma trade-off?

Given the limited degree of freedom, the regression analysis of inflation as a dependent variable on MI, ERS, FOI, FXR and their interaction has been focused on the entire sample period of 1970-2012. As the three trilemma indices are collinear, the estimated regressions used two policy indices at a time. The results are presented in Table 4.

The R-squared for the regressions are in the range of about 0.25 to 0.43, similar to the range of 0.16 to 0.46 obtained for India by Hutchinson, et. al (2010).

- Capital Mobility: The increase in capital mobility (FOI) has the most direct, significant and predominant dampening impact on inflation. Increased financial integration with the outside world helped in reducing inflation. However, when capital inflows openings were interacted with foreign reserves (FOI*FXR), this has a large, positive and significant association with inflation, counteracting the effect of FOI alone. This suggests that reserves hoarding tends to soften the impact of this policy stance.
- Exchange Rate Stability: The increase in ERS dampens inflation, but not in a significant way; suggesting a weak relationship between the objectives of exchange rate stability and inflation rates. The interaction of ERS*FXR shows positive but insignificant sign on inflation. ERS, FOI, and FXR are positive and move in the same direction interactively as they are geared towards external balance, while MI is geared towards internal balance, albeit unsuccessfully.

- Monetary Independence: The increase in MI alone is positively related to inflation, but in an insignificant manner. MI*FXR is of the opposite sign suggesting that the presence of FXR softens the impact of MI stance, with either FOI or ERS. When increased monetary independence is interacted with increases in reserves, this dampens inflation, but also in an insignificant way.
- Foreign Reserves: The direct impact of foreign reserves hoarding on inflation is also examined. Foreign reserves are negatively correlated with inflation, except when monetary independence variable is included and capital mobility variable is excluded in column 5, when the sign of the coefficient becomes positive, but insignificant. The best empirical results were obtained in Column 4 when the objectives of ERS and FOI, and omission of MI, are combined with FXR. ERS, FOI, and FXR individually reduce inflation rates, when the objective of MI is traded-off. This makes intuitive sense: when financial integration is given, reserves hoarding provides some flexibility in dealing with short-run trade-offs between exchange rate stability and monetary independence. Overall, the increase in foreign reserves has helped to mitigate the severity of the Trilemma, especially when combined with ERS and FOI objectives.

Table 4: Inflation, Trilemma Configurations and Reserves

	1	2	3	4***	5
Intercepts	28.84	28.974	29.273	66.215	-25.393
	2.566	2.5634	1.1489	5.606	-1.103
FXR		-23.304	-53.94	-274.49	193.65
		-0.771	-0.336	-2.852	1.377
ERS	-1.558	-1.4044		-17.858	-11.547
	-0.224	-0.2006		-1.5191	-0.8567
ERS*FXR				127.27	139.4
				1.407	1.33
MI	11.018	13.753	41.3167		110.21
	0.6826	0.828	1.0674		2.727
MI*FXR			-217.26		
			-0.9315		
FOI		-72.523	-152.73	-183.92	
		-3.257	-3.1103	-4.136	
FOI*FXR			660.33	844.29	
			2.031	2.727	
R-Squared	0.3085	0.3191	0.4087	0.4271	0.248

V.   Navigating the Policy Trilemma

V.1   Global Practices with the Trilemma

A sample of global Trilemma practices among developed countries, BRIC, MINT, SANE, and Oil producing countries was examined. Among the advanced countries considered as at 2012, the policy choices in France were exchange rate stability and capital mobility, with a loss of monetary independence and relatively low foreign reserves to GDP ratio; the United Kingdom policy choices were high capital mobility, monetary independence, with less exchange stability and low reserves ratio; Switzerland opted for high capital mobility, with high reserves ratio of more than 80.0 per cent minimising the tension between exchange rate stability and monetary independence.

Table 5: Global Trilemma Practices

Advanced and Emerging Markets			Other Countries		
	Policy Choice	**Trade-Off**		**Policy Choice**	**Trade-Off**
Developed Countries			**SANE**		
UK:	FOI and MI	ERS	SA	MI and ERS	FOI, high Reserves
FR:	ERS and FOI	MI	AL	MI and ERS	FOI, high FRS
SW	FOI and ERS	MI, high FRS	EG	MI and FOI	ERS, low FRS
BRIC			**OIL PRODUCERS**		
BR:	MI and FOI	ERS	SA	ERS and FOI	MI , high FRS
RU:	MI and FOI	ERS,	VE	ERS and MI	FOI, how FRS
CN	ERS and MI	FOI, high FRS	AO	ERS and MI	FOI, high FRS
MINT			**Low Reserve African Countries**		
MX:	FOI and MI	ERS	CI:	ERS, MI	FOI
ID:	**ERS , FOI, MI**	**Medium FRS**	**GH:**	**Poorly**	**ERS , FOI, MI**
TR	MI and FOI	ERS	KE	MI and FOI	ERS
			High Reserve Asian Countries		
			HK	ERS and FOI	MI negotiated
Indonesia has navigated the trilemma			SG	FOI and MI	ERS negotiated
better with an intermediate regime than			MY	MI, and ERS	FOI negotiated
most countries with values of 0.4 evenly,			*High reserves provide a cushion for*		
and given its low reserve ratio of 0.13%.			*successful trade-off in HK, SG, MY, CN, SW,*		
Rounding the corners of the Trilemma.			*SA, and AL.*		

Among the BRIC countries, China stood out with emphasis on exchange rate stability and low degree of capital mobility, while high reserves ratio has enhanced its ability to conduct independent monetary policy. Brazil and Russia focused more on monetary independence and capital mobility, with exchange rate stability ranking third. Among the four countries, India appeared to have relatively less ability to navigate the three trilemma policy stance. The four MINT countries had relatively low reserves ratios, with Mexico favouring open capital mobility, while navigating between exchange rate stability and monetary independence; Turkey put more emphasis on monetary independence and capital mobility and less on exchange rate stability. Indonesia is in the intermediate range among the three choices. Relative to the other MINT countries, Nigeria had higher exchange rate stability and monetary independence, but lower capital mobility.

Among the high reserve small Asian nations, Hong Kong and Singapore favoured high capital mobility, while Malaysia had low capital mobility, but slightly more monetary independence. Among the large oil producing countries, Saudi Arabia had successfully navigated the trilemma with very high reserve ratio, stable exchange rate, high capital mobility, and intermediate monetary policy stance. Angola and Venezuela opted for stable exchange rate and closed capital mobility, with relatively low monetary policy independence, than even that of Nigeria. Among the SANE countries, Egypt opted for higher degree of capital mobility and monetary independence; South Africa had high monetary independence, but low exchange rate stability and capital mobility. Algeria had low capital mobility, an intermediate monetary policy, but high foreign reserves ratio of more than 90.0 per cent. Among the smaller African countries, Cote D'Ivoire had exchange rate stability, but low capital mobility and monetary independence; while Kenya had high degree of capital mobility and monetary independence. Ghana performed poorly on all three trilemma policy indices.

Figure 9: High Reserves Countries
Series 1: Hong Kong; Series 2: Switzerland; Series 3: Singapore; Series 4 Saudi Arabia.
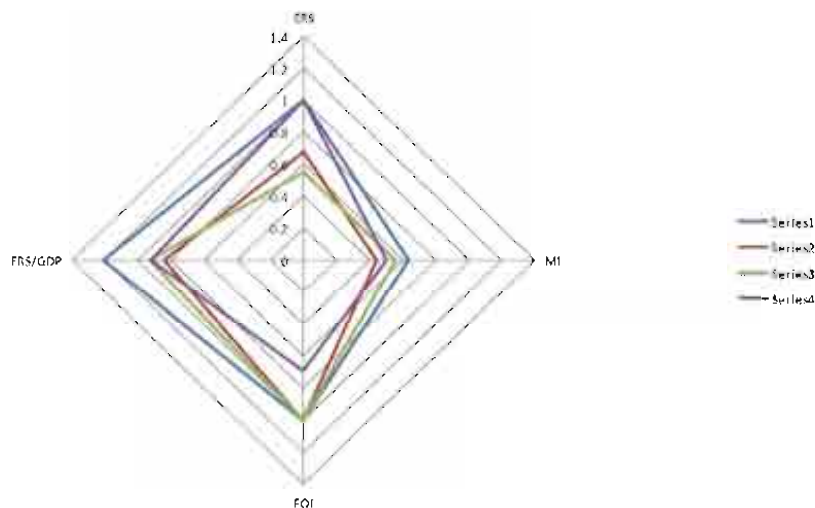
As at 2012, countries with very high reserve ratio of 50.0 per cent to 100.0 per cent of GDP (Hong Kong, Switzerland, Saudi Arabia, Singapore, and China) appeared to navigate the trilemma very well, irrespective of exchange rate regimes, with fixed exchange rate in Saudi Arabia (SA) or floating exchange rates in Switzerland; irrespective of financial integration regimes, with closed capital mobility in China or open capital mobility in Switzerland; and irrespective of monetary policy regime, with monetary independence in China or lack of monetary independence in Hong Kong. With low reserves, an intermediate regime rounding the corners is best. Indonesia appears to have successfully navigated the economic policy trilemma by pursuing an intermediate regime among ERS, MI, and FOI, with modest foreign reserves as a ratio of GDP of 13.0 per cent. For Nigeria, with FXR of 10.0 per cent, FOI of 0.306467, to move towards an intermediate regime, more exchange rate flexibility and some loss of monetary independence may be necessary. With FOI constant and FXR low, there is increasing tension between exchange rate stability and monetary independence.

Figure 10: Trilemma: Nigeria and Indonesia
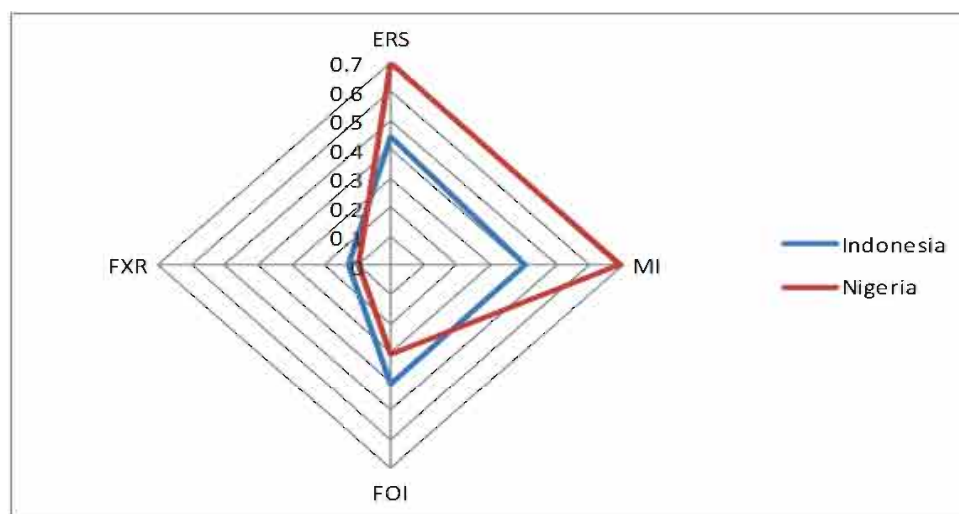
V.2   Summary and Conclusions

The impossible trinity or trilemma refers to the trade-offs policymakers in an open economy face. They can choose a combination of two of ERS, MPI and FOI, but not three simultaneously. Trilemma Indices for ERS, MPI, and FOI have been constructed for 170 countries including Nigeria. We examined the evolution of the policy trilemma indices for Nigeria from 1970 to 2012, descriptively, statistically, and empirically. We find that the trilemma does exist for Nigeria, when the three policy objectives were regressed on a constant number 2. An increase in one implies a decrease in another objective or two objectives. Monetary Independence and financial integration were the main dominant

factors. In general, monetary independence dominated throughout the sample period. However in Phase I, between 1970 and 1985, the objective of exchange rate stability was maintained as closed capital mobility dominated with extensive capital control. In Phase II, 1986-1999, monetary management dominated as exchange rate stability was lost with more flexible exchange rate regime and more capital mobility. In Phase III, 2000-2012, the sharp increase in capital flows created tension between MI and ERS, as exchange rate depreciated sharply.

The increase in foreign reserves has helped to mitigate the severity of the Trilemma, especially when combined with ERS and FOI objectives. Foreign reserves are negatively correlated with inflation. The best empirical results were obtained when the objectives of exchange rate stability and financial integration, with loss of monetary independence were combined with higher foreign reserves accumulation. Capital mobility alone has the most direct, significant, and predominant dampening impact on inflation. With capital mobility objective constant, and foreign reserves low, there is increasing tension between the objectives of exchange rate stability and monetary independence. Indonesia appears to have successfully navigated the Economic Policy Trilemma by pursuing an intermediate regime among ERS, MI, and FOI, with modest foreign reserves as a ratio of GDP of 13.0 per cent. For Nigeria, with foreign reserves to GDP ratio of less than 10.0 per cent, and a given level of capital mobility indicator, to move towards an intermediate regime, more exchange rate flexibility and some loss of monetary independence may be required.

In short, in the face of multiple goals including macroeconomic stabilisation and financial stability in an economy with increased financial globalisation, fiscal slippages, external terms of trade shocks, financial market distortions, foreign capital famine, and low foreign reserves, monetary and exchange rate policy carry a bigger burden.

V.3   Scope for Further Research

Given the importance of the policy trilemma for the monetary authorities, it is essential to continue to refine the framework, the methodology and data set used in this paper. It is recommended that the study be extended to 2014 and beyond as data become available. More importantly, a new set of the three trilemma indices should be constructed using quarterly data, which will even provide more insights as to the evolution of the policy stances within each given year. The framework can also be used to study the impact of the policy stances on inflation volatility, and not only inflation level, as well as output volatility, and financial stability. While the level of reserves ratio provides insights on the ability to maneuver with respect to the trilemma policy choices, actual policy execution will reflect in the changes in the level of reserves. Another research question worthy of pursuing: should foreign reserves be used as a gun powder or as a nuclear weapon? The issue of foreign capital feast and famine becomes more relevant in the context of a financial trilemma, distinct from monetary trilemma. As noted by Obstfeld (2014), the costs and benefits of capital controls require more research as capital flows pose a severe trade-off problem and macro-prudential tools are weakened. When are capital controls useful and what types of capital controls are effective?

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