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The Dynamics Of Central Bank Independence In A Developing Economy

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Abstract

Through an investigation of selected jurisdictions, this paper aims to contribute to the extant literature in investigating the relationship between central bank independence and price stability, as well as how such a relationship varies between different jurisdictions – even though it is widely argued that political and legislative interference is often contributory to price instability. This paper employs times series data to study the dynamics of central bank independence in the Nigerian economy. This study also employs bivariate cointegration methodology to examine the long-term relationship between inflation index and the different measures of financial development in the Nigerian economy.

Key Words: inflation, price stability, central bank independence, monetary policy, financial stability

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Introduction

In most economies, the financial system architecture plays a significant role in economic development. At the pinnacle of the financial structure is a central bank which performs basic functions such as keeping the payments system and the financial structure safe and sound; and providing financial services to the governments and other financial intermediaries. More significant is the bank's role in monetary policy which has implications for the long-run growth and development of the economy. Studies have shown that a high level of central bank independence is required to assure price stability in an economy (Cukierman, 1992 and Cukierman et al., 1992). Further, it is believed that the government generally suffers from inflation bias which is injurious to the economy (Kydland and Prescott, 1977; Barro and Gordon, 1983). In order to arrest this situation, an independent and conservative central bank is needed to neutralize the inflation bias in the economy (Rogoff, 1985). Earlier empirical investigations of this subject matter are based on cross-sectional analysis and their results point in the direction of a negative relationship between central bank independence and inflation especially in industrial countries. So far, only a couple of studies are based on time series analysis. This paper employs times series data to study the dynamics of central bank independence in the Nigerian economy.

Central Bank Independence: Theory and Evidence

The issue of central bank independence is as old as one can image. Ricardo ……. Keynes

According to Fischer (1995), central bank independence can be dichotomized into two, *goal independence* and *instrument independence*. A central bank has goal independence when it is given power to set its policy goals. On the other hand, a central bank has instrument independence when it is given freedom to select what it considers an appropriate policy instrument to achieve its mandate as defined by its enabling law.

There exists a growing body of knowledge on the rationale for central bank independence.

Following Berger et al. (2001) one assumes that government policy makers in an economy try to minimize the following loss function.

$$L^g = \frac{1}{2}\pi_t^2 + \frac{x}{2}(y_t - y_t^*)^2 \qquad (1)$$

Where
y_t = actual output in the economy
y_t^* = desired output
x = government weight on output stabilization with x > 0
π_t = actual inflation

In the model defined, output is defined in terms of a Lucas supply function of the form:

$$y_t = (\pi_t - \pi_t^e) + \mu_t \qquad (2)$$

Where

π^e_t = inflation expectation

μ_t = random shock with zero mean and a constant variance

In Equation 1, policy makers try to minimize the loss function on a period-by-period basis. In doing this, inflation expectation is assumed given. However, with rational expectations, inflation is modeled as:

$$\pi_t = xy_t^* - \frac{x}{x+1}\mu_t \qquad (3)$$

In Equation 3, the first term on the right hand side defines the inflation bias of policy makers. The second term reflects the degree to which stabilization of output shocks affect inflation. Note that a country with a high inflationary bias would face a problem of credibility. This is why conservatism on the part of a central bank translates into inflation aversion relative the government. In view of the foregoing, the loss function for a central bank is defined as:

$$L^{cb} = \frac{1+\varepsilon}{2}\pi_t^2 + \frac{x}{2}(y_t - y_t^*)^2 \qquad (4)$$

In Equation 4, ε represents additional inflation aversion associated with a central bank. Eijffinger and Hoeberichts (1998) define monetary policy as:

$$M_t = \gamma L^{cb} + (1-\gamma)L^g \qquad (5)$$

Using Equation 5, Eijffinger and Hoeberichts define γ as the degree of central bank independence which measures the extent to which a central bank's loss function affects monetary policy-making. If γ = 1, then the central bank if fully in control of monetary policy making.

In a rational expectations environment, minimizing government's loss function in Equation 1, results in inflation of the form:

$$\pi_t = \frac{x}{1+\gamma\varepsilon} y_t^* - \frac{x}{1+\gamma\varepsilon+x}\mu_t \qquad (6)$$

When one compares Equations 3 and 6, it becomes clear that for positive values of γ and ε, inflation bias is smaller in Equation 6. This means that a conservative central bank will under rational expectations, be more inflation-biased than government policy makers. Therefore, an independent and conservative central bank will strive to lower the level of inflation if the function is delegated to it.

The Nigerian Financial Landscape And Central Bank Of Nigeria

The predecessor of the Central Bank of Nigeria was the West African Currency Board (WACB) which was established by the colonial government in about 1912. The WACB had neither the power to initiate monetary policy nor the power to regulate the flow of money in circulation (Olalusi, 1992). In the early 1950s, the clamor for political independence for Nigeria also embodied a call for the establishment of a central bank.

This call was based on the view that such an institution was needed to consolidate the financial resources of the country for the purpose of rapid economic development (Olalusi, 1992). According to Bibilari (1962), indigenous banking in Nigeria stemmed from a desire to bolster the country's clamor for political independence rather than an attempt to make money by banking operators.

In 1990, Odedokun (1990) reports results indicating that the conventional policy goals of price stability, a high level of employment, and external balance did not drive the conduct of monetary policy in Nigeria from 1970 through 1982. According to the author, aggregate monetary policy considerations featured deposit flows as well as demand for funds by the federal government. Moreover, the ideologies of the ruling government and the need to follow the political directives of the government in power attained prominence.

The power of the Central Bank of Nigeria (CBN) was enlarged via two new Decrees:[1] the Central Bank of Nigeria Decree #24 and the Banks and Other Financial Institutions Decree #25 (BOFID). The new laws facilitated the introduction of new financial instruments for the purpose of enhancing the ability of the CBN to manage the monetary system. Moreover, according to Sanusi (2002a, 2002b), interest rate deregulation de-emphasized the use of credit allocation and control policies. It paved the way for the use of indirect controls such as open market operations (OMO), reserve requirements, and moral suasion in monetary management (Nnanna, 2001).

1 Updates to the Central Bank of Nigeria Act 2007 and significance of proposed amendments to the Central Bank of Nigeria Act 2007 will be considered in Part III to this paper.

Research Methodology

Four measures of financial development employed in this paper are annual data from 1970 through 2003 obtained from the World Bank and Heston et al (2002). These data which measure the size of financial intermediaries in Nigeria are:

(i) The ratio of deposit money bank assets to central bank assets (DMCD)

(ii) Ratio of liquid liabilities to GDP (LLGDP)

(iii) Ratio of central bank assets to GDP (CBGDP)

(iv) Ratio of deposit money bank assets to GDP (DMGDP). Deposit money banks are financial institutions whose deposit liabilities are transferable through checks or some other similar payment methods.

This study employs bivariate cointegration methodology to examine the long-term relationship between inflation index and the different measures of financial development in the Nigerian economy. Prior to the application of cointegration test, the stationarity property of the time series is established by applying the Augmented Dickey-Fuller (ADF) test. The test is performed on the following equation:

$$\Delta Z_t = \lambda t + \rho Z_{t-1} + \sum_{i=1}^{q} \beta_i \Delta Z_{t-i} + \varepsilon_t \qquad (7)$$

where,

$\Delta = (1-L)$ as in $\Delta Z_t = Z_t - Z_{t-1}$

Z = series under consideration

t = time trend

q = lag chosen such that the error term in (7) is a white noise

The ADF test is applied to test the null hypothesis that each time series has a unit root. The test adjusts for error autocorelation.

The cointegration method assumes that if two variables, x and y, contain some stochastic trend, each can be described as an integrated variable. Furthermore, if a linear combination (say, x – αy) is stationary, then the two variables are considered cointegrated. According to Taylor (1988), if economic theory suggests a long-run equilibrium relationship between x and y, then a linear combination of the two series will not only be stationary, but their cointegration is a necessary condition for them to have a stable long-run relationship. This suggests that the existence of a stable long-run relationship between two integrated variables means that they are also cointegrated. Thus, the following cointegration regression is employed.

$$x_t = \alpha + \beta y_t + \mu_t \qquad (8)$$

The test of cointegration of x and y is based on the equation above but with μ generated from Equation (8) used in place of Z in Equation (7). In order words, if μ is integrated using the PP test, then x and y are cointegrated. If x and y are cointegrated, it means that both series have a long-run relationship.

Results

Table : Data Descriptive Statistics

	INF	DMCD	LLGDP	CBGDP	DMGDP
Mean	0.159	0.605	0.210	0.120	0.153
Standard Deviation	0.104	0.169	0.069	0.075	0.058
Skewness	0.963	0.106	-0.076	0.220	0.483
Kurtosis	2.898	2.267	2.032	2.472	2.062
Jarque-Bera Statistic	5.269	0.824	1.361	0.668	2.568

Table : Data Correlation Matrix

	INF	DMCD	LLGDP	CBGDP	DMGDP
INF	1.000	-0.455	0.143	0.518	-0.027
DMCD		1.000	-0.306	-0.892	-0.155
LLGDP			1.000	0.516	0.903
CBGDP				1.000	0.417
DMGDP					1.000

Table : Unit Root Test Results

	INF	DMCD	LLGDP	CBGDP	DMGDP
Series in Levels					
ADF Statistic	-3.140	-1.415	-1.775	-1.446	-1.261
KPSS Statisitc	0.171	0.382***	0.196	0.460***	0.194
First Difference of Series					
ADF Statistic	-5.910*	-6.114*	-4.979*	-4.185*	-4.500*
KPSS Statistic	0.5000**	0.229	0.153	0.261	0.115

*, **, and *** denote statistical significance at the 1%, 5%, and 10% levels, respectively. The null hypothesis under the ADF test is that the series are non-stationary, but under the KPSS, the null hypothesis is that the series are stationary.

Table : Johansen Bivariate Cointegration Test Results

λ_i	H_0	H_1	λ-max statistic	H_0	H_1	λ-trace statistic
(a) Inflation and DMCD						
0.507	r = 0	r = 1	22.647**	r = 0	r = 1	24.209**
0.048	r ≤ 1	r = 2	1.562	r ≤ 1	r = 2	1.562
(b) Inflation and LLGDP						
0.359	r = 0	r = 1	14.225	r = 0	r = 1	17.952**
0.110	r ≤ 1	r = 2	3.727	r ≤ 1	r = 2	3.727
(c) Inflation and CBGDP						
0.380	r = 0	r = 1	15.303**	r = 0	r = 1	18.351**
0.091	r ≤ 1	r = 2	3.048	r ≤ 1	r = 2	3.048
(d) Inflation and DMGDP						
0.325	r = 0	r = 1	12.566	r = 0	r = 1	15.082
0.076	r ≤ 1	r = 2	2.516	r ≤ 1	r = 2	2.516

r denotes the number of cointegration vectors. ** denotes rejection of the null hypothesis at the 5% level. The critical statistical levels are based on MacKinnon-Haug-Michelis (1999).

The results in the Table indicate that inflation and DMCD as well as inflation and CBGDP are cointegrated.

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FIGURE 1: GRAPHICAL REPRESENTATION OF TIME SERIES