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POLITICAL AND ECONOMIC DETERMINANTS OF SEIGNIORAGE IN NIGERIA

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ABSTRACT

Seigniorage is a source of revenue for governments in developing countries especially if such countries are politically unstable. Nigeria as an oil export dependent has been faced with fluctuating revenues over the years. This short-fall at times was funded by seigniorage apart from other sources such as taxes and external debts. This has posed problems to the macroeconomic management of the economy. The sole objective of this paper is to evaluate the impact of political and economic determinants of seigniorage in Nigeria. The study covers the period from 1970 to 2007. Variables of interest to the study include seigniorage, per capita income, agriculture GDP ratio, trade GDP ratio and a set of proxies for political stability. Agriculture GDP ratio and trade GDP ratio were used to proxy the economic structure while political stability was proxied by three measures namely political rights, political stability and political stability dummy. Both determinants were evaluated within the context of the multiple regression analysis. Results show that per capita income and political instability were a major determinant of seigniorage, while, the economic structure was insignificant in explaining seigniorage. This study is of the view that political stability matters for managing the level of seigniorage in Nigeria. Hence, there is need for commitment by political leaders to manage resources efficiently so as not to resort to printing money.
Keywords: *Seigniorage, Political Stability and Development*

INTRODUCTION

Seigniorage from money and its role as a government revenue source have been well recognized in the literature. However, the importance of political determinants of seigniorage has not been fully articulated in the literature with respect to Nigeria. This paper evaluates the significance of political and economic determinants of seigniorage in Nigeria. Conventional seigniorage is the revenue that the government obtains through the issuance of money due to the household's willingness to hold money at zero market interest rates Seigniorage is defined as the real revenues a government acquires by using newly issued money to buy goods and non-money assets. Furthermore, money seigniorage is the product of the interest rate on the market portfolio and the stock of money holdings. Following this definition of money seigniorage, it is necessary to consider the place of various indicators of political behaviour.

THE PROBLEM

In view of the fact that Nigeria is a developing country and is sometimes constrained in sourcing funds for development projects, it sometimes resorts to seigniorage to finance such. Other relevant reasons are the fact that before 1999, Nigeria had not experienced a stable political environment and hence, this made policy makers take short term measures to fund whatever project they wanted to execute. This characteristic was more pronounced given the extent of poverty in particularly Nigeria Jha (2001). So, for every incumbent to stay in power, he carries out conspicuous spending on poverty reducing projects. Secondly, according to Jha (2001), developing countries are weaker politically and economically than developed countries. This is evidenced by the fact that there are little resources available since the tax base is small and tax administration lax. As such, much tax revenue comes from indirect tax such as excise duties, petroleum tax and VAT. The coexistence with a developing credit and bond market and fiscal expenditures that are inflexible downwards makes some of the financing of the resultant deficit spills over into the external sector and the central bank. In addition, external shocks have a severe effect in the least developed countries than other developing countries. A case is global crunch experienced in the early 80s. A way out of the problem was to source for external finance, however, such supplies were meager in the face of diminishing official aid and poor private equity flows. Furthermore, they were available at increasingly difficult terms as the costs of borrowing became increasing higher given the frequent reversals of policy stance. A consequence of these factors was that Nigeria had to rely considerable on monetary financing of the deficit. Moreover, if it was financed by the Central bank, it resulted in raising the monetary base and the money supply, thereby blurring the distinction between monetary and fiscal policies. A disadvantage of foreign financing was that it raised the cost of servicing external debt while domestic bond issues raised interest rates. A substantial period of the time, the country was burdened by a huge debt which made Nigeria borrow short term loans at unfavorable terms. As a result, there was need for a cheaper source of income which was seigniorage.

OBJECTIVE OF THE PAPER

The purpose of this paper is to estimate the impact of political and economic determinants of seigniorage in Nigeria.

JUSTIFICATION OF THE PAPER

This paper is justified on the basis of the fact that seigniorage revenues are on average five times higher in developing countries than in industrial countries. Therefore, analyzing the political and economic determinants of seigniorage is an important task, in the case of Nigeria. This paper's major contribution to the literature is testing whether the relationship holds considering the fact that Nigeria has had a long period of political instability. As studies by Cukierman et al. (1992) confirm that greater political instability leads to higher seigniorage levels. They argued that tax evolution was a function of the political system and economic structure of a country.

SCOPE OF THE STUDY

This study covers the period 1970 to 2007. It is limited to quantifying the relationship between political indicators such as political stability and political rights, measures of the macro economy and seigniorage.

OUTLINE OF THE STUDY

The rest of the paper is structured as follows; section 2 presents a survey of the empirical and theoretical literature on the relationship between seigniorage, political instability and institutions in addition to explaining the Nigerian economic environment. The dataset, statistical analysis and empirical model are described in section 3. Section 4 presents the empirical results, and Section 5, the summary of findings, conclusions and policy recommendations of the paper.

LITERATURE REVIEW

Conceptual Framework

Seigniorage is defined historically to be the difference between the face value of a coin and its costs of production and mintage (Buiter, 2007). The coins were minted by the State with each coin containing an amount of precious metal equal in value to the nominal exchange value stamped on the coin. The State mint would accept gold from individuals for coining while charging a fee, called a seigniorage charge. So long as that fee exceeded the mint's costs, the State would receive net revenue, in other words, seigniorage revenue from its minting operation. In modern times, seigniorage has been defined in several ways. Seigniorage is defined in two alternative ways according to Aise and Veiga (2008) as the change in reserve money as a percentage of nominal GDP and secondly the change in reserve money as a percentage of government revenues (most popular). He further defines it as real revenues a government acquires by using newly issued money to buy goods and non-money assets. Two additional ways of measuring seigniorage, used by Cukierman et al. (1992), are the product of reserve money by the inflation rate divided by either GDP or government revenues. These authors have shown that these two additional alternative measures of seigniorage provide similar results. Another alternative, used by Click (1998), is the change in the monetary base as a percentage of government spending.

THEORETICAL REVIEW

According to Woo (2005), governments that are able to finance their expenditures through taxes or debt do not need to rely on seigniorage revenues. Several studies have explored the idea that structural features of a particular economy help determine its taxable capacity. Chelliah et al. (1975), provides evidence that countries with larger per capita non-export income, more open to trade and with larger mining but smaller agricultural sectors have, on average, a higher taxable capacity. This result leads to the conclusion that the countries' ability to tax is technologically constrained by their stage of development and by the structure of their economies (e.g. size of the agricultural sector in GDP), and as tax collecting costs are high and tax evasion pervasive, countries might use seigniorage more frequently. The theory of optimal taxation (see Phelps, 1973; Végh, 1989; Aizenman, 1992) rationalizes government behavior in many countries showing that it might be optimal for governments to rely on seigniorage if other taxes are highly distortionary. According to this theory, governments optimally equate the marginal cost of the inflation tax with that of output taxes, therefore minimizing the distortions to the economy when choosing the optimal combination of taxes to finance their expenditures. Edwards and Tabellini (1991) and Cukierman et al.

(1992) fail to find evidence that this theory applies to developing countries. Cukierman et al. (1992) developed a theoretical model whereby political instability and ideological polarization determine the equilibrium efficiency of the tax system and the resulting combination of tax revenues and seigniorage that governments use. Cukierman et al. (1992) assumed that economies with weaker institutions might be unable to build efficient tax systems leading them to resort more frequently to seigniorage as a source of revenue. They argue that the agricultural sector is the toughest to tax while foreign trade is the easiest to tax. Using a probit model to determine the likelihood of an incumbent government to remain in power, they show evidence that higher political instability leads to higher seigniorage. More relevant to Nigeria is the view by Andrabi (1997) who views budget-making process in many countries as a negotiated process between various interest groups with significant autonomy with these interest groups having enough political power to have a major say in deciding their contribution to the national treasury.

THE MODEL

The model draws extensively from Cukierman et al. (1992). The focus is on the political determinants of the tax system and the economy is described by two equations namely the budget constraint of the government and the private sector as in equation 1 and 2 below.

$$g_t + f_t \leq \tau_t(1-\theta_{t-1}) + s_t \qquad \textbf{1}$$

$$c_t \leq 1 - \tau_t - s_t - \delta(\tau_t) - \gamma(s_t) \qquad \textbf{2}$$

The subscripts denote time periods. Each individual is endowed with one unit of output in each period. The variables g_t and f_t represent two different public goods in per capita terms, and C_t is per capita private consumption. The government collects from each individual an amount s_t, in the form of seigniorage and an amount r_t of tax revenue. The main difference between taxes and seigniorage is that a fraction θ_{t-1} of the tax revenue is wasted due to tax-collection costs, whereas seigniorage carries no administrative costs. Both taxes and seigniorage impose deadweight losses on the private sector, equal to δ (τ_t) and γ (s_t), respectively. These distortions increase at an increasing rate. Thus, $\delta'(\bullet) > 0$, $\delta''(\bullet) > 0$, $\gamma'(\bullet) > 0$, and $\gamma''(\bullet) > 0$. In equation (1), θ_t is a rough measure of the efficiency of the tax system. A lower value of θ implies a more efficient tax system. Thus, in this model, a tax reform amounts to a choice of θ, whereas a fiscal policy is a choice of g, f, r, and s. To capture the greater inertia in reforming the tax system than in changing fiscal policy, we assume that θ, but not the other policy variables, must be chosen one period in advance. Thus, θt is chosen at time t but exerts an influence on tax-collection costs only at time t + 1. There are two possible policymaker types, L and R, who randomly alternate in office. The policymaker of type i, i = L, R maximizes

$$W_t^i = E_t\left\{ \sum_{k=0}^{\infty} \beta^k [U(c_{t+k}) + H^i(g_{t+k}, f_{t+k})] \right\} \qquad \text{where } 1>\beta>0 \qquad 3$$

where $E_t(\bullet)$ denotes the expectation operator, $U(\bullet)$ is a concave and twice continuously differentiable utility function, and $H'(\bullet)$ is defined as follows: if i = L,

$$H^{L}(g,f)=\left(\frac{1}{\alpha(1-\alpha)}\right)\min[\alpha g,(1-\alpha)f] \qquad 1>\alpha>0 \qquad 3^1$$

and if i=R, then HR(•) is defined as in (3'), but with ɑ replaced by (1 - ɑ). Thus, these two policymakers differ only in the desired composition of the public good. For simplicity, their disagreement is parameterized by ɑ. The more distant ɑ is from ½ the more they disagree. By construction, the overall weight given to private versus public consumption does not depend on ɑ. The political system is described as a Markov process with transition probabilities п and 1 - п: the government that is in office at time t has a fixed probability 1 - п of being reappointed next period. With probability п, it is thrown out of office and the other policymaker type is appointed. These simplifying assumptions can be ex-tended in several ways. These results holds if the political process is modeled as in Alesina and Tabellini (1990), where rational voters elect the policymaker type at the beginning of each period. In this model, the political system has two important features: its instability, represented by the probability of losing office, п, and the degree of polarization between the alternating governments, represented by the disagreement parameter ɑ. These two features determine the equilibrium efficiency of the tax system.

POLITICAL DETERMINANTS OF SEIGNIORAGE IN NIGERIA

The Nigerian Environment

The fundamental principles of State Policy in the 1999 Constitution of the Federal Republic of Nigeria mandate mainly that the security and welfare of the people shall be the primary focus of government. Before the transition to democracy in 1999, Nigeria was characterized by volatility in its political climate (Instability and policy reversals) as well as instability of most macroeconomic aggregates. For instance according to NNPC (2004), per capita GDP in Nigeria was among the lowest in the world during the 1980s and 1990s at $300 and this cost the country decades of development as it was below the level necessary to reduce poverty. The country was heavily indebted, however much of the debt had been liquidated as at 2005. The agricultural and the manufacturing sector had been stagnating in terms of their growth rates, except for the services and the telecommunication sector which have been experiencing a boom. The economy was characterized by low savings investment equilibrium (at less than 20 percent). Furthermore, fiscal decentralization has been a major challenge to effective macroeconomic stabilization and efficient public finance management due lack of policy coherence between the organs of government. Institutions were weak and economic governance poor, due to the military regimes. There was lack of political will and commitment, and this led to extra budgetary expenditures. Moreover, rents from oil were an easy but volatile source of revenue to government.

Trend Analysis of Seigniorage in Nigeria

A popular measure of seigniorage in the literature as noted by Aisen and Veiga (2006) is money reserves as a share of government revenue. In the case of Nigeria it is observed from the graph below that seigniorage has been on the rise, reaching a peak in 2007 in a period where supposedly, the democratic government in power was relying less on seigniorage as a result of the central bank of Nigeria independence. It can be deduced from the graph that inflation is a possible factor responsible for the trend observed.

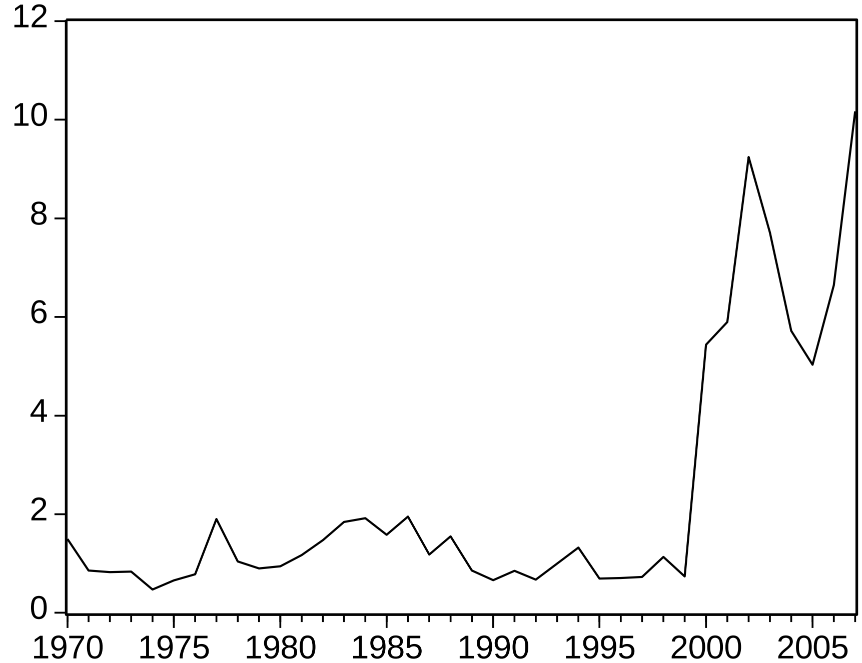

Figure 1: Seigniorage in Nigeria

METHODOLOGICAL AND EMPIRICAL REVIEW

In a related study Okunrounmu (2000) examined transparency, probity and accountability in fiscal operations. He noted that government borrowed cheaply with the private sector being compelled to invest in public debt instruments at market related interest rate with conversion at low rates of interest. According to Obadan (2001) the monetary policy implications of domestic debt financing was an upsurge in the size of financial debt with the bulk of it financed by the banking system. To this end, an independent central bank is needed. The theoretical argument in favour of central bank independence as seen in Rogoff (1985) is based on the public choice thesis. There are three main arguments in support of central bank's independence. First, central banks are more conservative than government and where fiscal policy dominates monetary policy, there is risk that fiscal deficits will be monetized. Third, from time inconsistency perspectives, it is likely that present plans may no longer be optimal at the time of implementation as the central banks have longer horizons than governments. Click (1998) estimates a model using 90 countries, from 1971–90, and finds that only 40% of the cross-country variation in seigniorage can be explained with the theory of optimal taxation. The empirical failure of this theory to fully explain the cross-country differences in the use of seigniorage revenues motivated the use of theoretical and empirical models focusing on the role played by political and institutional variables. Woo (2005) finds that social polarization is associated with fiscal instability and it generates incentives to engage in short-term policies leading to lower growth. Catão and Torrones (2005) argue that fiscal instability leads to higher seigniorage and inflation. Fischer et al. (2002) in a survey on modern hyper- and high inflations show that a positive relationship exists between fiscal deficits and seigniorage, democratic, traditionally unstable, and highly indebted countries. Finally, political instability has greater effects on seigniorage in countries that have lower central bank independence, lower economic freedom, lower creditworthiness ratings and lower openness to international trade. It is argued that a country characterized by frequent changes in the composition of government, frequent changes in macroeconomic policies, as a result of policy makers who do not share the views of their predecessors is more prone to resorting to seigniorage revenues. Secondly, frequent cabinet changes shorten the horizon of the members of government (Aisen and Veiga, 2006). The higher the probability of being replaced, the greater will be the importance attributed to short term objectives. Then, since the costs of future inflation are not fully internalized, it is difficult to resist the temptation to finance current expenditures with seigniorage revenues. Andrabi (1997) in modeling the relationship between political institutions goes beyond the static story to present a simple dynamic model involving decentralized decision making and examine the equilibrium cooperative tax-seigniorage mix that results. To this end, he applied game theory.

Aisen and Veiga (2006) in their paper utilize instrumental variable models to estimate the main political and institutional determinants of cross- country and cross-time differences in seigniorage across countries. This is in contrast to Cukierman et al. (1992) who confirm that countries with more unstable and polarized political systems have a higher probability of raising seigniorage using a probit model. The variables of interest include indicators of political stability or government change, economic performance, political events and structural variables and this is common to most literature on the topic.

METHODOLOGY

Model Specification

The empirical model for seigniorage levels is summarized as follows in line with Aisen and Veiga (2006);

$S_t = \alpha PI_{t-1} + \beta SP_t + \delta PS_t + Eco_t + EcP_t + e_t$

where S_t is seigniorage, PI_{t-1} is a proxy for political instability, SP_t is a proxy for social polarization, PS_t is the Polity Scale, Eco_t is a vector of economic structural variables, EcP_t is a vector of variables accounting for economic performance and external shocks, e_t is the error term.

A variant of the model is used for this study and it is specified below

$S_t = C_t + Y_t + AGRIC/GDP_t + TRADE/GDP_t + P_t + e_t$

Where S_t stands for seigniorage, C_t is the intercept, Y_t for per capita income, $AGRIC/GDP_t$ and $TRADE/GDP_t$ are a set of variables proxying the economic structure of the country. P_t is a proxy for political stability and three different measures are used. They include political rights (PR), political stability (POLST) and a political stability dummy (POLDUM) which takes the value 1 for years of democratic rule in Nigeria and 0 for otherwise. A positive coefficient is expected is expected for political stability, as greater instability should lead to greater reliance on seigniorage revenues (Aisen and Veiga, 2006). The more open an economy is, the less they rely on seigniorage in order to avoid the real appreciation of the home currency associated with higher inflation.

It is anticipated that democracy is associated with lower reliance on seigniorage. A set of economic structural variables that reflect characteristics of the countries that may affect their capacity to control inflation includes Agriculture (%GDP). According to Chelliah et al. (1975), a positive coefficient is expected. Trade (%GDP) and openness to trade is used since it is associated with larger revenues of import duties, a negative coefficient is expected. Real GDP per capita is also used and it is indicative of the fact that poor countries have an inefficient tax system and, thus, have a more need for seigniorage, a negative coefficient is expected. Variables accounting for economic performance and external shocks include change in terms of trade. A favorable evolution of terms of trade provides greater tax revenues and negative coefficient is expected.

Description and Sources of Data

The dataset is composed of annual data on political and economic variables for the years 1970 to 2008. The source of political data is political stability and absence of violence/terrorism from Kaufmann, Kraay and Mastruzzi (2008). An alternative is to use political rights measured on a scale of one to seven, with one representing the highest degree of freedom and seven the lowest. Ratings falling between 1.0 and 2.5 were designated free, between 3.0 and 5.0 partly free and between 5.5 and 7.0 not free. A more direct measure of political instability is the use of a dummy variable for democratic regimes as a proxy for ideological polarization. The data on political rights is obtained from the Freedom House ratings, the Penn World Tables (PWT 6.1) as published by Heston, Summers and Aten (2002), for data on population used to deflate the GDP and the CBN statistical bulletin for broad money (M2), GDP measured at current factor prices and total federal government revenue used to proxy government revenue. Seigniorage is defined as the change in money supply (measured as M2) as a share of government revenues.

Estimation Technique

This paper adopts an OLS multiple regression analysis to estimate the relationship between seigniorage and political/ economic variables. The test statistic used to evaluate the results is the t-statistic (evaluates the significance of each variable), R-squared and adjusted R-squared (explains how much of the dependent variable is explained by the independent variables) and the F-statistic (evaluates the overall significance of the model).

Empirical Results

The results of the regression is as follows,

	S (1)	S (2)	S (3)
C	1.506590	2.720001	3.150808
	(2.701353)	(0.945831)	(3.263851)
Y	0.042905	0.051551	0.049304
	(5.820459)	(6.209716)	(7.103269)
AGRIC/GDP	-2.189349	-3.306399	-3.412471
	(-1.018487)	(-1.457160)	(-1.561113)

TRADE/GDP	0.920277	1.341981	1.391544
	(1.019894)	(1.400984)	(1.507877)
POLDUM	1.330230		
	(2.268712)		
POLST		0.385571	
		(0.219775)	
PL			-0.204680
			(0.2059)
R-squared	0.737028	0.696456	0.710615
Adjusted R-squared	0.705153	0.659663	0.675538
F-statistic	23.12218	18.92896	20.25875

Computed by Author

The results show that per capita income is a major determinant of seigniorage in Nigeria. It exhibits a positive and significant relationship with seigniorage as indicated by the t - statistic. This result is not in line with findings by Aisen and Veiga (2006), which show that a negative relationship exists between per capita income and seigniorage. This could mean that government raised seigniorage to boost the living standards of the citizens. In the case of agriculture and trade as share of GDP, both are not significant in explaining whether the economic structure of the country determines the level of seigniorage. In addition, they exhibit the wrong signs contrary to what obtains in the literature for developed countries. However, the signs are in line with the characteristics of a developing country. Of the three indicators of political stability used in the regression, it is only the political stability dummy that is positively significant. The sign is the same even when the variable was lagged to take into cognizance the fact that seigniorage occurs as after a lag of political stability. The sign is in line with earlier conclusions reached by Aisen and Veiga (2006) and Cukierman et al. (1992). This is indicative of the fact that political instability has been a major factor influencing seigniorage in Nigeria. The R-squared in the three equations range between approximately 70% and 74% and this is indicative of a good fit of the model by the independent variables. The case is the same for the adjusted R-squared which ranges between 66% and 71%. The F-statistic shows that the overall model is significant.

SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

In summary, this study made an attempt to estimate some economic and political determinants of seigniorage in Nigeria. Results gotten showed that political instability was a major factor affecting seigniorage, however, this result differed on the basis of the type of measure used. However, all the indicators of political stability gave the right sign. In a bid to look at the impact of economic variables on seigniorage, namely agriculture and trade share of GDP, it was discovered that they were not significant in explaining seigniorage in addition to carrying the wrong signs. A critique of the literature show that many authors applied their findings to developed economies and so the sign derived in this work is characteristic of

developing countries. Intuitively, the conclusions to be derived from this paper are that political stability matters for seigniorage, while the economic structure is not significant. The policy implication of this conclusion is that there is need for commitment on the part of leaders to credibly and efficiently manage the resources of the country, irrespective of whether their tenure is shot term or long term.
Agenda for future work could be investigating whether ethnicity has a role to play in seigniorage.

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