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AN ANALYSIS OF THE IMPACTS OF FREEDOMS ON ECONOMIC GROWTH

John Kagochi
Nii O. Tackie
and Henry Thompson

ABSTRACT

This paper examines the relationship between democracy and economic growth in Nigeria. We find no sizeable variations in economic growth as a result of changes in economic freedom. Political freedom, however, enhances economic growth. The results also suggest that while increases in capital investments have had positive effects on Nigeria's economic growth, increases in crude oil prices have not had similar effects. The study concludes that political freedom explains economic growth in Nigeria, but economic freedom does not.

John Kagochi: Research Associate of Applied Economics, Auburn University; email: kagocjm@auburn.edu
Nii O. Tackie: Associate Professor of Applied Economics, Tuskegee University; email: ntackie@tuskegee.edu
Henry Thompson: Professor of Economics, Auburn University; email: thomph1@auburn.edu

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INTRODUCTION

Economists have always tried to understand what causes economic growth. On the one hand, early economists like Adam Smith stressed the importance of gains from trade, economies of scale, and economic policy as the sources of growth. On the other hand, modern growth theory based on the work of Solow posits the inputs of capital, labor, and technology as the sources of economic growth (Gwartney et al., 1999). Advances in growth theory (Lucas, 1988; Romer, 1990) interpreted labor broadly to include human capital and investments in education, training, "learning by doing," and other forms of human capital acquisition. Countries grow by acquiring more inputs, increasing physical capital, improving education and skill level of workers, and adopting improved technology. However, historical experience has shown that expanding the availability of inputs does not always, by itself, lead to economic growth.

Consequently, the past decade has seen renewed interest in the effects of institutions and policies on economic growth. Temple (1999) stresses the importance of an economic environment that is consistent with the development and efficient use of resources. These include monetary and price stability, secure property rights, and openness to international exchange that exert independent impacts on economic growth. Inappropriate institutions and policies can cause growth to be sub-optimal. Democracy has usually been considered as one of the key processes in society to enhance economic growth. Economists have tried to look at the link between sound institutions embedded in democracy and economic growth using cross-national studies, developing countries included (Barro, 1996; Boko, 2002; Heckelman, 2000;), but not for specific developing countries per se. It is therefore necessary to examine the effects of democracy on economic growth using case country studies, for instance in this case, Nigeria.

Nigeria is a country where democracy and economic growth have had their share of ups and downs. It is Africa's most populous nation with 151 million inhabitants (Nigerian High Commission, 2003). Since its independence in 1960, Nigeria has tried five constitutions and had twelve leaders, most of them soldiers. Following decades of misrule, Nigeria's transportation, communications, health, and public services sectors have been ailing. Once a breadbasket, Nigeria witnessed a severe deterioration of its agricultural sector. Social, religious, and ethnic unrest further complicate business ventures in Nigeria. Moreover, the government remains highly over-reliant on oil exports for revenue, and is subject to the volatility of the world price for petroleum (U.S. Department of State, 2002).

Given its abundant human and natural resources, Nigeria seemed destined to become a regional economic giant; but this has not happened. Despite being United States' fifth largest oil supplier and amassing oil revenues worth $340 billion over four decades (UN Office for the Coordination of Humanitarian Affairs, 2002), Nigeria seems trapped in an economic quagmire with most of its people earning less than a dollar a day (UNDP, 2000). Since 1990, the relative share of petroleum in total exports has been about 96%. Agriculture's contribution has fluctuated between 0.5% and 2.3% while the share of other products has fluctuated between 0.5% and 1.7%. Petroleum exportation has totally dominated Nigeria economy and government finances since the mid1970s (Iyoha and Oriakhi, 2002). The succession of dictatorial regimes, disregard for human rights, political instability, and economic mismanagement have all contributed to undermine Nigeria's economic growth and development potential (Salisu, 2000). The present paper examines the relationship between democracy and economic growth in Nigeria. The objectives of the paper are (1) to develop a working model of freedoms and economic growth for Nigeria, (2) to test empirically the influence of freedoms and other factors on economic growth in Nigeria, and (3) discuss the policy implications.

2. DEMOCRACY AND ECONOMIC GROWTH

Several studies on developing countries have argued that democracy depends on the level of economic prosperity resulting from economic growth of a society. In other words, the more economic output a society generates, the greater will be its chance of sustaining democracy (Bilson, 1982; Pennar et al., 1993). According to Bilson (1982) economic growth enables the dynamic elements of the society to become independent of the government both economically and socially, therefore promoting democracy. Furthermore, Pennar et al. (1993) argue that economic growth generates democracy because as people become more educated as a result of economic well-being, they begin to demand democracy. Other studies (e.g., Londregan and Poole, 1996; Feng, 1997) provide empirical support for this thesis.

However, other studies on developing countries (e.g., Keefer and Knack, 1997; Persson and Tabellini, 1994; Alesina and Rodrik, 1994; Olson, 1982; Boko, 2002; Hanke and Walters, 1997; Przeworski and Limongi, 1993; Easton and Walker, 1997; De Haan and Sturm, 2000; Baba, 1997; Burkhart and Lewis-Back, 1994) have taken the alternative approach of examining the link between democracy and economic growth (i.e., economic growth depends on democracy). The literature includes negative, positive, and no views on the issue. On the negative side, Keefer and Knack (1997) found a negative link between democracy and economic growth. Persson and Tabellini (1994) and Alesina and Rodrik (1994) argue that democracies may damage economic performance because they give voice to disadvantaged groups. Redistribution demands of these groups may divert resources from productive investment expenditures and thus harm economic growth. Similarly, Olson (1982) argues that rent-seeking behavior of interest groups in democracies may cause economic stagnation.

On the positive side, Boko (2002), Hanke and Walters (1997), and Przeworski and Limongi (1993) established the existence of a

positive link between political freedom as well as economic freedom (measures of democracy) and economic growth. Easton and Walker (1997) found that changes in economic freedom had a significant impact on the level of income even after the level of technology, the level of education of the workforce, and the level of investment were taken into account. De Haan and Sturm (2000) showed that positive changes in economic freedom lead to positive changes in economic growth. They report a significant impact of economic freedom on economic growth. Similarly, Baba (1997) argues that democracy enables the development of institutions that guarantee the transparency of the policy-making process which in turn promotes economic growth. Furthermore, he notes, key guarantees such as property rights that are critical to economic growth are present in democracies. However, Burkhart and Lewis-Back (1994) found no link at all between democracy and economic growth.

3. MODEL

In order to look at the relationship between freedom, capital formation, and growth the index of freedom is added to the standard neoclassical growth model. This model is used because it contains a shift parameter that "reflects not just technology, but other factors such as resource endowments, climate, and freedoms" (Mankiw et al., 1992, pp. 410-411), thereby making explicit the link between freedom and economic growth. The neoclassical growth model is a production function with positive and diminishing marginal products as well as constant returns to scale. It relates output (Y) to a pair of essential inputs, capital and labor (K and L), and to the shift parameter (A) representing technology, institutions or freedoms. The production function is of Cobb-Douglas form, output in period t is defined as:

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha} \qquad 0<\alpha<1 \qquad (1)$$

$$\frac{Y_t}{L_t} = At \left(\frac{K_t}{L_t}\right)^{\alpha} \qquad (2)$$

Simplified as:

$$y_t = A_t k_t^{\alpha} \qquad (3)$$

The economy's aggregate production function can be summarized as: $y = Af(k)$ where y is per capita output, A is multifactor productivity, k is the capital stock per capita, and f represents a neoclassical production function. It is assumed that the technological or institutional progress is labor-augmenting and that the rates of growth of population, technological or institutional progress, and depreciation are constant and exogenous for any period. The general model can therefore be summarized as:

$$y_t = f(A_t, k_t) \qquad (4)$$

and $A_t = A(P_t, PF_t, EF_t)$ thus:

$$y_t = f(P_{t,} PF_{t,} EF_{t,} k_t) \qquad (5)$$

where:
y_t = effective GDP (as a ratio Y/L)
P_t = price of crude oil (in constant dollars)
PF_t = political freedom (as an index)
EF_t = economic freedom (as an index)
k_t = effective capital (as a ratio K/L)

The price variable is included in the model since 90-96% of export from Nigeria is crude oil. We hypothesize that increasing crude oil prices will have a positive impact on output growth. In

addition, we hypothesize that output growth is negatively influenced by the political freedom index. The reason is lower values of political freedom mean more political freedom and the lower political freedom values should generate more economic growth, and vice versa. Economic freedom enhances the efficiency with which productive inputs are converted into output, and therefore we hypothesize the economic freedom index will positively impact economic growth. Similarly, we hypothesize that capital will have a positive influence on growth, because the higher the capital the higher the output growth. In short, all independent variables, except political freedom, are expected to have positive signs vis-a-vis Nigeria's economic growth.

4. DATA COLLECTION AND ANALYSIS

Data on gross domestic product (GDP), labor force, and gross capital investment were obtained from World Bank Development Indicators (2004). Crude oil prices were obtained from the U.S. Department of Energy, Energy Information Administration (2004). Political freedom data were obtained from Freedom House (2004). Freedom House gathers political freedom data for each country. The data consist of two components, political rights and civil liberties, which are averaged to create an index. Each country is assigned a rating based on a scale of 1 to 7, with 1 representing the highest degree of political freedom and 7 the lowest level of political freedom. Economic freedom index (EFI) data were obtained from the Fraser Institute (2004). The EFI measures the degree of economic freedom present in five major areas: size of government – expenditures, taxes, and enterprises; legal structure and security of property rights; sound money; freedom to trade with foreigners; and regulation of capital, labor, and business markets (Gwartney and Lawson, 2003). Each country is assigned a rating based on a scale of 1 to 10, with 1 representing the lowest degree of economic

freedom and 10 the highest level of economic freedom. All data covered the period 1970-2000.

The study uses time series analysis that assumes the time series variable evolves as a process described as a function of its own history or time. The general form is stated in an error correction model (ECM) format as:

$$\Delta lnyt=\alpha 0+\alpha\ 1\Delta ln\ Pt+\alpha 2\ \Delta lnPFt+\alpha 3\ \Delta lnEFt+\alpha 4\Delta lnkt+\alpha 5\ rt+\varepsilon t \quad (6)$$

where:

$$r = lnyt\text{-}1 - \beta 0 - \beta 1ln\ Pt\text{-}1 - \beta 2lnPFt\text{-}1 - \beta 3\ lnEFt\text{-}1 - \beta 4lnkt\text{-}1 \quad (7)$$

r is the residual error for the spurious model

Time series analysis requires that the variables be stationary. Otherwise, the F-statistics from the tests will follow non-standard distributions, and the empirical results will be misleading (Sims, et al., 1990). If the original variables are non-stationary, then they must be transformed into stationary series by differencing the series until they are stationary. ECM is used because it fulfills the above condition. Also, a spurious model is stated and used. After the spurious model and ECM are estimated, another model, the reported model, is calculated. The ECM is stated as a difference model and cannot be reported as such, so it has to be manipulated and stated in a reported model format. The reported model, shown below, is calculated from the ECM.

$$\ln y_t = \gamma_0 + \gamma_1 \ln P_t + \gamma_2 \ln PF_t + \gamma_3 \ln EF_{t+}\ \gamma_4 \ln k_t \quad (8)$$

Ordinary Least Square analysis was used to estimate the parameters for the spurious model, ECM, and related tests (shown in the Appendix). To calculate the reported model, spurious regression coefficients are substituted into the ECM and assumption is

made that at steady state current output is equal to previous year's output. The criteria for analysis are the t-test, F-test, and R^2. Tests are performed at the 10% and 5% levels.

5. RESULTS AND DISCUSSION

Table 1 shows results from the reported model. The coefficients are -0.050, -0.110, -0.440, and 0.180 for crude oil price, political freedom, economic freedom, and capital. Capital was significant at the 5% level and had the expected sign. Political freedom was significant at the 10% level and had the expected sign. However, economic freedom was significant at the 5% level but did not have the expected sign and crude oil price was significant at the 10% level but did not have the expected sign.

As a way of interpreting the results for crude oil price, for example, an increase of 10% in crude oil price will result in a 0.5% decrease in GDP. Similarly, an increase of 10% in political freedom index will result in a 1.1% decrease in GDP; an increase of 10% in economic freedom index will result in a 4.4% decrease in GDP; and a10% increase in capital investment will result in a 1.8% increase in GDP. The F value of 2.768 was significant at the 5% level, and the R^2 was 0.38.

Table 1: Reported Model

Variable	Coefficients	t-Value(df, 24)	F5,24	R2
Intercept	-9.130	-0.323		
P	-0.050	-1.984	2.768	0.38
PF	-0.110	-1.562		
EF	-0.440	-2.158		
K	0.180	2.929		

The relationship between economic growth and political freedom and capital, respectively is consistent with the prediction of this study and the underlying economic theory. Political freedom gives citizens the opportunity to provide feedback to government officials about the effectiveness of policies. Thus, in this instance it may have created an environment to reverse at least some adverse policies and embrace positive ones that ultimately led to economic growth. With regards to capital, higher capital formation encourages economic growth and this is what appears to have happened in this case. However, the negative coefficients of crude oil price and economic freedom are not as predicted. The negative coefficient of crude oil price is not that surprising since higher crude oil prices benefit the oil sector, but they also constitute a negative supply shock for all other sectors of the economy which use oil as an input.

One of the plausible reasons for the unexpected sign for economic freedom index was given by Salisu (2000) who stresses that the oil boom of the 1970s and 1980s was responsible for 'Dutch Disease' syndrome in Nigeria in subsequent years. That is, the appreciation of the real exchange rate led to a loss of competitiveness of exports since there was no proper redistribution of income from the oil sector to other sectors. Another reason may be attributed to sheer economic mismanagement. Yet a third reason may be attributed to the lack of identification power due to a small sample and insufficient variability in the EFI data.

6. SUMMARY AND CONCLUSION

This study examines the relationship between democracy and economic growth in Nigeria. The data used for the study was obtained from World Bank Development Indicators, U.S. Department of Energy, Freedom House, and Fraser Institute. Time series and ordinary least square analysis were used to analyze the data

and a spurious model and an ECM were estimated. The reported model was calculated from the ECM.

The results indicate that crude oil price, political freedom, economic freedom, and capital had significant influence on growth, though the signs on crude oil price and economic freedom were unexpected. In addition, the results provide the evidence that political freedom in Nigeria promotes economic growth, and growth in capital formation contributes to economic growth in Nigeria. The significant and expected relationships between political freedom index and capital and economic growth confirms the fact that favorable political climate and accumulation of capital stock promotes economic growth.

In terms of policy, the Nigerian authorities should continue to embark on creating favorable political environment. Regarding crude oil, the government should be willing to initiate greater transparency and accountability in managing the country's oil earnings to enhance economic growth. Transparency and accountability will also ensure that economic freedom translates to economic growth.

APPENDIX

Derivation of the reported model:

The estimated model is summarized in four steps. The first step involved testing variables for the time series stationarity by applying the autoregressive, AR (1), regression using the following model for the *y* variable and was repeated for the other variables:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \varepsilon_t \qquad (A1)$$

If the series is stationary, the residual series ε_t in the estimated AR(1) process must be white noise, whose conditions include zero mean, zero covariance and constant variance.

The second step involved a Dickey-Fuller (DF) Unit Root test.

Since all variables are not stationary, a DF test for trend stationarity was estimated using the following model for the *y* variable and was repeated for the other variables:

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \varepsilon_t \quad \text{(A2)}$$

The third step involved including a trend term in the DF test. The following model was estimated for the *y* variable and $\{\varepsilon_t\}$ checked for white noise. It was repeated for the other variables:

$$\Delta y_t = \alpha_0 + \gamma_1 y_t\text{-}1 + \alpha_1 t + \varepsilon_t \quad \text{(A3)}$$

The fourth step involved the error correction model (ECM). This was estimated since variables were integrated of order one and were analyzed using the "long term" spurious regression as well as checking the residual $\{\varepsilon_t\}$ white noise with the Engle-Granger regression $\Delta\varepsilon_t = \alpha_1\varepsilon_{t-1} + \xi_t$.

Thus:

$$\ln y_t = \alpha_0 + \alpha_1 \ln P_t + \alpha_2 \ln PF_t + \alpha_3 \ln EF_t + \alpha_4 \ln k_t + \varepsilon_t \quad \text{(A4)}$$

The following ECM model was finally estimated:

$$\Delta \ln y_t = \alpha_0 + \alpha_1 \Delta \ln P_t + \alpha_2 \Delta \ln PF_t + \alpha_3 \Delta \ln EF_t\ \alpha_4 \Delta \ln k_t + \alpha_5 \Delta r_t + \varepsilon_t \quad \text{(A5)}$$

where:

$$r = \ln y_{t-1} - \beta_0 - \beta_1 \ln P_{t-1} - \beta_2 \ln PF_{t-1} - \beta_3 \ln EF_{t-1} - \beta_4 \ln k_{t-1} \quad \text{(A6)}$$

Equations (A5) becomes:

$$\ln y_t - \ln y_{t-1} = (\alpha_0 - \alpha_5\beta_0) + \alpha_1 \ln P_t + \alpha_2 \ln PF_t + \alpha_3 \ln EF_t + \alpha_4 \ln k_t - (\alpha_1+\alpha_5\beta_1) \ln P_{t-1} - (\alpha_2+\alpha_5\beta_2) \ln PF_{t-1} - (\alpha_3+\alpha_5\beta_3) \ln EF_{t-1} - (\alpha_4+\alpha_5\beta 4) \ln k_{t-1} + \alpha_5 \ln y_{t-1} \quad \text{(A7)}$$

$$\ln y_t = (\alpha_0 - \alpha_5\beta_0) + \alpha_1 \ln P_t + \alpha_2 \ln PF_t + \alpha_3 \ln EF_t + \alpha_4 \ln k_t - (\alpha_1+\alpha_5\beta_1) \ln P_{t-1} - (\alpha_2+\alpha_5\beta_2) \ln PF_{t-1} - (\alpha_3+\alpha_5\beta_3) \ln EF_{t-1} - (\alpha_4+\alpha_5\beta 4) \ln k_{t-1} + (1+\alpha_5) \ln y_{t-1} \quad \text{(A8)}$$

Substitute significant coefficients from Appendix Tables C and D into equation A8 to get the reported equation.

$$lny_t = -6.20 + 0.05lnP_t - 0.04lnPF_t - 0.26lnEF_t + 0.17lnk_t - 0.08lnP_{t-1} - 0.03lnPF_{t-1} + 0.09lnEF_{t-1} - 0.05lnk_{t-1} + 0.32lny_{t-1} \quad (A9)$$

Assume that in the long-run, $lny_t = lny_{t-1}$ and solve

$$lny_t = -9.13 - 0.05lnP_t - 0.11lnPF_t - 0.44lnEF_t + 0.18lnk \quad (A10)$$

Table A: AR (1) Test for Stationarity

Variable	α_1	SE	adjR^2	Mean$\{\varepsilon_t\}$	Cov $\{\varepsilon_t\}$	Corr $\{\varepsilon_t\ \varepsilon_{t-1}\}$
Lny	0.852	0.098	0.718	0	0.003	0.07
Lnk	0.900	0.090	0.781	0	0.044	0.46
lnP	0.782	0.103	0.663	0	0.07	0.12
lnPF	0.737	0.127	0.529	0	0.08	0.11
lnEF	0.899	0.195	0.412	0	0.007	0.08

$x_t = \alpha_0 + \alpha_1 y_{t-1} + \varepsilon_t$

The null hypothesis of nonstationarity is rejected if α is less than one.

Table B: The Dickey-Fuller Unit Root Test

Variable	$\alpha 0$	γ	t-Stat (tDF-2.62)	Mean$\{\varepsilon t\}$	Cov $\{\varepsilon t\}$	Corr $\{\varepsilon t\}$
Lny	0.48	-0.148	-1.50797	0	0.003	0.07
Lnk	0.96	-0.1	-1.10517	0	0.044	0.46
lnP	0.75	-0.218	-2.1232	0	0.08	0.13
lnPF	0.40	-0.263	-2.06614	0	0.08	0.12
lnEF	0.14	-0.101	-0.51735	0	0.007	0.085

$\Delta x_t = \alpha_0 + \gamma_1 x_t + \varepsilon_t$

The null hypothesis of nonstationarity is rejected if γ is less than one.

Table C: Spurious Model

Variable	Coefficients	t- Value (df,26)	F4,26	R2
*I*ntercept	6.193	29.795		
P	-0.046	-1.984*	17.757	0.73
PF	-0.048	-1.562*		
EF	-0.260	-2.716**		
K	0.184	6.702**		

* indicates significance level less than 0.10.

**indicates significance level less than 0.05.

Table D: ECM Model

Variable	Coefficients	t- Value (df, 24	F5,24	R2
Intercept	-0.003	-0.323		
ΔlnP	0.049	1.564*	2.768	0.38
ΔlnPF	-0.042	-1.420		
ΔlnEF	-0.262	-2.158**		
ΔlnK	0.172	2.929**		
ΔR	-0.678	-2.896**		

* indicates significance level less than 0.10.

**indicates significance level less than 0.05.

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