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**DOES DEMOCRACY FACILITATE ECONOMIC GROWTH OR DOES ECONOMIC  
GROWTH FACILITATE DEMOCRACY? AN EMPIRICAL STUDY OF SUB-SAHARAN  
AFRICA**

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**Abstract**

This paper examines the relationship between democracy and economic growth in 30 Sub-Saharan African countries. As our proxy for democracy we first use the democracy index constructed by Freedom House and then check the sensitivity of our findings using, as an alternative proxy for democracy, the Legislative Index of Electoral Competitiveness (LIEC). We find support for the Lipset hypothesis - in the long run, real GDP Granger causes democracy and an increase in GDP results in an improvement in democracy - in Botswana and Niger with both datasets, for Chad with the Freedom House data only and for Cote d'Ivoire and Gabon with the LIEC data only. Support for the compatibility hypothesis - in the long run democracy Granger causes real income and an increase in democracy has a positive effect on real income - is found for Botswana with the Freedom House data and for Madagascar, Rwanda, South Africa and Swaziland with the LIEC data. Support for the conflict hypothesis - in the long run democracy Granger causes real income and an increase in democracy has a negative effect on real income - is found for Gabon with the Freedom House data and Sierra Leone with the LIEC data.

**KEYWORDS:** Causality, Democracy, Economic Growth, Sub-Saharan Africa.

**JEL CLASSIFICATION NUMBER:** O1, O4

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## **DOES DEMOCRACY FACILITATE ECONOMIC GROWTH OR DOES ECONOMIC GROWTH FACILITATE DEMOCRACY? AN EMPIRICAL STUDY OF SUB-SAHARAN AFRICA**

### **1. Introduction**

There has been a surge of interest in the relationship between democracy and economic growth in recent times. Economists have focused on the effect of democracy on economic growth, while political scientists have studied the effect of economic growth on democracy. This interest reflects, at least partly, that the relationship between democracy and economic growth is contentious. While some studies have found that democracy has a positive effect on economic growth, other studies suggest a negative relationship or no relationship at all. Similarly, although most studies have found that economic growth has a positive effect on democracy, there is no consensus on this issue, particularly at low levels of economic development. While democracy is sometimes equated with the right to vote (Cheung, 1998, p. 247), here we define it more broadly than whether a country has elections. We follow the definition given by Rivera-Batiz and Rivera-Batiz (2002, pp. 135–136) who stated: “Democracy ... [extends to] whether a country has checks and balances on executive powers, constitutional processes and guarantees, freedom of the press and the absence of censorship, clear and effective judicial and legal structures, incumbent term limits, and transparency, openness and citizen input in policymaking”.

This paper considers the democracy-growth nexus in Sub-Saharan Africa (SSA). While there have been a few exceptions, such as Botswana, SSA has generally had a poor record of economic growth, dating back over a long period of time. Between 1980 and 1990, average annual growth in real GDP per capita was -0.65%; between 1990 and 1994, it was -2.2% and between 1995 and 1999 it was 0.4% (Fosu, 2001). Several reasons have

been offered for SSA's poor economic performance including high population growth, poor export performance, low levels of human capital, inefficiencies in the public sector and ethnic conflicts (World Bank 1984, 1990; Easterly and Levine, 1997; Schatz, 1994).

Several studies have considered the effect of political variables on economic growth in SSA (Ghura, 1995; Ojo and Oshikoya, 1995; Easterly and Levine, 1997; Guillaumont *et al.*, 1999). Other studies have examined the effect of political instability on savings (Gyimah-Brempong and Traynor, 1996) or investment (Gyimah-Brempong and Traynor, 1999) in SSA. Political instability, in particular, has been found to be an important reason for the observed low growth of SSA (Guillaumont *et al.*, 1999). However, a problem with most existing studies that have tested for a correlation between democracy and economic growth, including those on the democracy-growth relationship in SSA, is that they fail to adequately address the issue of causation. And this limitation of past research is important given that the direction of causation is in dispute. The concept of Granger causality provides a useful tool with which to examine the democracy-growth nexus and simultaneously test the economic and political science hypotheses. Granger causality has been widely used in other contexts; however, with a few exceptions (Burkhart and Lewis-Beck, 1994; Glasure *et al.*, 1999; Campos and Nugent, 1999), it has not been used to examine the causal relationship between democracy and economic growth.

This paper makes three contributions to the literature on democracy and economic growth in SSA. First, for 30 SSA countries, using time series data we test for a long-run relationship between democracy and economic growth using the bounds testing procedure to cointegration, based on an unrestricted error correction model developed by

Pesaran and others (Pesaran and Pesaran, 1997; Pesaran *et al.*, 2001). The major advantage of using the bounds testing approach to cointegration over the alternatives for our purposes is that it can be used irrespective of the order of integration of the variables, and it has superior properties in finite samples, compared with other methods. We utilize exact critical values for the bounds test that are specific to our sample size. The second contribution is that for those countries where we find cointegration, we estimate the long-run elasticities. We use three estimators: fully modified ordinary least squares (OLS) (Phillips and Hansen, 1990), Dynamic OLS (Stock and Watson, 1993) and Engle and Granger (1987) OLS to provide a check on the robustness of our findings. Third, we examine the existence, and direction, of long-run and short-run Granger causality.

The remainder of the paper is set out as follows. The next section provides an overview of the competing hypotheses in the existing literature on the relationship democracy and economic growth. Section 3 sets out the econometric approach and presents the findings from the study. Section 4 summarizes the findings using the alternative measures of democracy. Section 5 discusses the results and Section 6 contains the conclusion.

## **2. Competing Hypotheses on the Democracy-Growth Nexus**

There are three major theses concerning the effects of democracy on growth that have been dubbed the “conflict”, the “compatibility” and the “skeptical” hypotheses (Sirowy and Inkeles, 1990). The conflict hypothesis proposes that democracy and economic growth are incompatible. One reason suggested for this incompatibility is that elected officials will make myopic decisions designed to maximize their electoral success (Comeau, 2003). This behaviour makes officials vulnerable to the overtures of rent-seeking interest groups (Krueger, 1974) and special interest politics (Olson, 1982), such

as the labour unions whose demands will cut into entrepreneurs' profits and slow the rate of economic growth (Gupta *et al.*, 1998). In contrast, the conflict hypothesis proposes that authoritarian regimes are insulated from redistributive politics, which allows them to enact policies conducive to long-term growth (Comeau, 2003). Moreover, as the residual claimants of their countries' wealth, dictators have an interest in furthering growth to increase their share of national income (McGuire and Olson, 1996).

A second argument made by advocates of the conflict hypothesis is that democracy is less conducive to long term stability (World Bank, 1991, pp. 131–132) or to long-term development (Barro, 1996), given the proclivity of majority voting systems to legislate for redistribution of income, including land reforms, from the rich to the poor. Cheung (1998) put forward a third argument that corruption is more likely to flourish under democracy than dictatorship. The rationale for Cheung's position is that in an authoritarian regime, "people on top want to maintain their hold on power and corruption is one thing that will most likely destroy this. The cost of corruption is high for dictators. But if someone is elected into office, because power is transient there is an incentive to go on the take" (Cheung, 1998, p. 248). Cheung's view, however, overlooks subtleties between regime types. Corruption can exist in both democracies and dictatorships. In addition, there is no consensus about the effects of corruption on economic growth. Some studies have found that corruption reduces growth (Mauro, 1995; Mo, 2001). However, other studies conclude that corruption has desirable properties for growth (Acemoglu and Verdier, 1998). The latter perspective suggests that corruption can act as a lubricant that reduces transaction costs and therefore increases the efficiency of the economy.

The compatibility hypothesis provides the opposite view to the conflict hypothesis. First, it suggests that political pluralism and institutional checks and balances are necessary to protect against systemic abuse or predatory behaviour, which are often associated with authoritarian regimes. According to North (1993), “well specified and enforced property rights, a necessary condition for economic growth, are only secure when political and civil rights are secure; otherwise arbitrary confiscation is always a threat”. Second, in contrast with the argument made for the conflict hypothesis, it is suggested that democratization might limit rent seeking due to its system of checks and balances (de Haan and Sturm, 2003). This view builds on Rodrik’s (2000) argument that democratic institutions can be viewed as the ultimate institutions for conflict management as they allow for differences among social groups to be resolved in a predictable, inclusive and participatory manner. The compatibility hypothesis is consistent with the view that economic and political freedoms are mutually reinforcing (Friedman, 1962). While there is nothing in principle preventing non-democratic governments from promoting economic freedoms (Barro, 1996), the compatibility hypothesis suggests that democracy is more conducive to promoting economic freedoms and growth than authoritarianism because the political legitimacy of a democracy depends on maintaining economic rights.

The intermediate position is the skeptical hypothesis which proffers that there is no systematic relationship between democracy and economic growth. What really matters is the effectiveness of policies implemented and the stability of the regime, rather than its type (Comeau, 2003). Clague *et al.* (1996) suggested that there can be growth enhancing democracies and growth-enhancing dictatorships and that the quality of economic policies depends on the time horizon of the dictator in autocracies and whether the

democratic system is durable in democracies. Their empirical findings suggest that autocrats who have been in power for some time provide better contractual and property rights than autocrats who have been in power a shorter period.

Advocates of the skeptical hypothesis argue that while it might generally be true that there is more economic freedom under a democracy than under authoritarianism, there is no guarantee that there will be an optimal outcome (Esposito and Zaleski, 1999). Democracies contain those whose aim is to challenge the private property status quo where it is in their best interests. Cheung (1998, p. 247) suggested: “If you look at the things people in the so-called democratic countries are voting on, in the absence of a well-defined constitution, the core issues generally involve infringement of property rights, which in turn undermine the system of private enterprise”. Moreover, the very nature of a democracy, with its emphasis on political freedom, creates more opportunities for such challenges to property rights (Przeworki and Limongi, 1993).

There is mixed empirical support for each of the hypotheses. This led Przeworki and Limongi (1993, p. 64) to conclude: “We do not know whether democracy fosters or hinders growth”. There is some evidence to suggest that political freedom has facilitated economic liberalisation in Central and Eastern Europe (De Melo *et al.* 1996, 1997; Dethier *et al.*, 1997). The balance of empirical evidence, however, seems to be with the conflict and skeptical views rather than the compatibility view. This is interesting in light of the fact that the literature on the political economy of SSA seems to have developed a consensus that rejects the conflict hypothesis, even if there is no clear support for the compatibility hypothesis (see Feng, 1996). Sirowy and Inkeles (1990) surveyed thirteen

studies of the democracy-growth nexus, six of which supported the skeptical view, four of which suggested qualified or conditional relationships, and three of which provided unconditional support for the conflict perspective. Borner *et al.* (1995) reported that of 16 empirical studies, three suggest a positive relationship and three a negative relationship between democracy and economic growth, and the other 10 are inconclusive. Brunetti (1997) examined 17 studies and found (p. 167) “nine studies report no relationship, one study a positive, one study a negative, three studies a fragile negative relationship and three studies a fragile positive relationship between democracy and economic growth”.

While economists have been primarily concerned with the effect of democracy on economic growth, political scientists have focused on the implications of economic growth for increased levels of political freedom. Most studies have found that economic growth results in more demands for political freedom (Lipset, 1959; Bollen, 1979; Bollen and Jackman, 1985; Burkhart and Lewis-Beck, 1994; Barro, 1996). Barro (1996) has termed this the Lipset hypothesis. Glasure *et al.* (1999) also found that in developing countries and newly industrialising countries, economic development has a significant effect on democratic performance, but contrary to Lipset *et al.* (1959), economic development leads to lower levels of democracy. Glasure *et al.* (1999, p. 475) concluded: “The sign reversal may stem from the possibility that as nations strive for economic development, the nations tend to trade-off democracy for economic development”.

### **3. Empirical Study**

#### *3.1 The Data*

We use data on real GDP and democracy  $[Y, D]$  for 30 SSA countries, as classified by the World Bank, for the period 1972–2001. All analyses are conducted in natural logs so



the coefficients can be interpreted as elasticities. The series on nominal GDP and the GDP deflator were extracted from the World Bank World Tables. Using the GDP deflator, nominal GDP was converted into real GDP. The time frame for the study was dictated by data availability. While data on GDP are available from the World Bank for most of the countries from 1960, the democracy data are only available from 1972. The democracy data were extracted from Freedom House (Gastil *et al.*, 1972–2001). Freedom House constructs their democracy indexes with the assistance of local and international printed materials, field visits and other communications with informed observers. Following a checklist of various components of democracy, countries are assigned a value for political rights between one (most free) and seven (least free).

We use the Freedom House scores on their unaltered 1-7 scale, rather than creating a dummy variable as in some previous studies. (For a recent study which uses the same approach as we do, see Comeau, 2003). According to Comeau, the advantage of using the original scale is twofold. First, it conveys more information. The availability of seven classes to rank countries gives the survey more flexibility to capture subtleties in differences in the level of democracy across countries. In a time series framework, this makes it easier to take account of moderate fluctuations in political freedoms on a year to year basis. Second, it is easier to interpret because there is no need to decipher the corresponding Freedom House score of a freedom level expressed in a dummy variable.

### *3.2 Order of Integration of the Variables*

In contrast to most cointegration tests, the bounds test for cointegration does not require *a priori* knowledge of the integration properties of the variables. However, all variables need to be integrated of order one ( $I(1)$ ) for the application for two of the three long-run

estimators we use; namely, the Phillips and Hansen (1990) fully modified OLS and the Engle and Granger (1987) OLS method. The variables also need to be integrated of the same order to conduct Granger causality tests. Given these requirements, to ascertain the order of integration we apply the Augmented Dickey and Fuller (ADF) and Phillips and Perron (PP) unit root tests. Both these unit root procedures test the null hypothesis of a single unit root against the alternative hypothesis that the series is stationary.

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 Insert Table 1  
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Table 1 reports the results of the unit root tests. In Table 1  $\ln Y$  is the natural log of real income and  $\ln D$  is the natural log of the democracy variable. The order of integration of the variables is given in the last two columns of Table 1. The tests produced similar results. When the ADF and PP tests suggest different results (for the democracy variable in Burundi, Kenya, Ghana, Mauritius and Zimbabwe and the income variable for Chad, Mauritius and Togo), the PP results are preferred because of their generally greater power (see Banerjee *et al.*, 1993, p.113). There are 17 countries (Botswana, Benin, Burundi, Central Africa, Cote d'Ivoire, Kenya, Madagascar, Mali, Ghana, Rwanda, Republic of Congo, Niger, Senegal, Sudan, Togo, Zimbabwe and Nigeria) where both the democracy and income variables are  $I(1)$ , seven countries (Gabon, Gambia, Malawi, Burkina Faso, South Africa, Swaziland and Zambia) where the democracy variable is  $I(1)$  and the income variable is  $I(0)$  and five countries (Cameroon, Chad, Lesotho, Mauritius and Sierra Leone) where the income variable is  $I(1)$  and the democracy variable is  $I(0)$  at the 5% level or better. In the Democratic Republic of Congo, the democracy variable is  $I(1)$ , while the income variable is integrated of order 2 or  $I(2)$ .

### 3.3. Cointegration

As indicated above, to examine whether there is long-run relationship between democracy and real GDP for the 30 SSA countries, we employed the bounds testing approach to cointegration. The bounds testing approach to cointegration involves estimating conditional error-correction models, treating democracy and real GDP, in turn, as the dependent variable. The  $F$ -test is applied to each conditional error-correction model to ascertain the existence of one or more long-run relationships. While the distribution of the  $F$ -statistic is non-standard, Pesaran *et al.* (2001) reported two sets of critical values, which are based on 40,000 replications of a stochastic simulation. This provides critical value bounds for all classifications of the regressors into purely  $I(1)$ , purely  $I(0)$  or mutually cointegrated for a sample size of 1000 observations.<sup>1</sup>

However, in this study, we only have a relatively small sample size of 30 observations. Thus, the relevant critical values were extracted from Narayan (2005). We estimated a model which included an intercept, but no trend. If the computed  $F$  statistics falls outside the critical bounds, a conclusive decision can be made regarding cointegration without knowing the order of integration of the regressors. If the estimated  $F$  statistic is higher than the upper bound of the critical values then the null hypothesis of no cointegration is rejected. If the estimated  $F$  statistic is less than the lower bound of the critical values then the null hypothesis of no cointegration cannot be rejected.

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Insert Table 2  
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The calculated  $F$ -statistics, together with the exact critical values are reported in Table 2. Our results indicate that of the 30 countries in our sample, real GDP and democracy are cointegrated for only nine countries (Botswana, Gabon, Chad, Cote d'Ivoire, Kenya, Democratic Republic of Congo, Niger, Rwanda, and Nigeria) at the 10% level or better; of which, for three (Gabon, Nigeria and Rwanda), there is cointegration only when real GDP is treated as the dependent variable and for five (Chad, Cote d'Ivoire, Democratic Republic of Congo, Kenya and Niger) there is cointegration only when democracy is treated as the dependent variable. However, for Botswana there are two long run relationships, meaning that democracy and real GDP are cointegrated when real GDP is the dependent variable and when democracy is the dependent variable.

#### *3.4. Long Run Estimators*

To estimate the long run elasticities for the relationship between democracy and real GDP where appropriate, we used three different estimators: Engle and Granger (1987) OLS, Phillips and Hansen (1990) fully modified OLS and the Stock and Watson (1993) dynamic OLS. We used more than one estimator to provide a check that our results are not contingent on the technique employed. This also provides a check of the robustness of our results. The Engle and Granger (1987) OLS involves estimating the cointegration relationship between the two variables  $\ln Y$  and  $\ln D$  using the regression models:

$$\ln Y_t = \eta_0 + \eta_1 \ln D_t + \xi_t \text{ and} \quad (1)$$

$$\ln D_t = \chi_0 + \chi_1 \ln Y_t + \tau_t \quad (2)$$

Here, all variables are as defined previously. The long run elasticity of interest is  $\eta_1$  and  $\chi_1$ . The estimator advocated by Stock and Watson (1993) involves estimation of long-run equilibria via dynamic OLS. This has the advantage that it corrects for potential

simultaneity bias among regressors. It entails regressing one of the  $I(1)$  variables on other  $I(1)$  variables, the  $I(0)$  variables, and lags and leads of the first difference of the  $I(1)$  variables. The rationale for incorporating the first difference variables and the associated lags and leads is to obviate simultaneity bias and small sample bias inherent among regressors. Standard hypothesis testing can be undertaken using robust standard errors derived via the procedure recommended by Newey and West (1987).<sup>2</sup>

The fully modified OLS (FMOLS) procedure, developed by Phillips and Hansen (1990), has two direct advantages. Apart from correcting for endogeneity and serial correlation, it also asymptotically eliminates the sample bias. There are two conditions considered essential to implement the FMOLS. First, there must only be one cointegrating vector. Secondly, the explanatory variables must not be cointegrated among themselves.<sup>3</sup>

The long run elasticities when GDP is the dependent variable and when democracy is the dependent variable are presented in the last three columns of Table 2. Note that because the Phillips and Hansen (1990) approach can only be applied where there is a single long-run relationship, we do not use it for Botswana. Similarly, because the Engle-Granger (1987) and Phillips and Hansen (1990) long-run estimators require both variables to be  $I(1)$  where the bounds test suggests there is cointegration but this condition is not satisfied, we only report the results from the Stock and Watson (1993) dynamic OLS.

We begin by looking at those countries for which there is a long run relationship between real GDP and democracy when real GDP is the dependent variable. For Botswana and Rwanda we found that a 1% improvement in democracy leads to a 0.6-1.0% and 1.73-1.95% increase in real GDP respectively, while in Gabon and Nigeria a 1% improvement

in democracy leads to a 0.41 and 0.35% fall in real GDP, respectively. However, note that the results for Nigeria are not robust because only the dynamic OLS long-run estimator gives a statistically significant result.

Next we looked at the long run elasticities for those countries when democracy is the dependent variable. In Botswana, Chad and Niger an increase in GDP results in an improvement in democracy, but for Kenya and the Democratic Republic of Congo, we found that an increase in real GDP has a negative effect on democracy. For Kenya the coefficient on real GDP is between 0.23 and 0.41, implying that a 1% increase in real GDP leads to a 0.23-0.41 % deterioration in democracy.

### 3.5. Granger Causality

To test Granger causality for the thirteen countries where both variables are found to be  $I(1)$ , we use a vector autoregression (VAR) model for those countries for which we could not establish a cointegration relationship and a vector error-correction mechanism (VECM) framework for those countries for which the variables were cointegrated. The latter case involves specifying a bivariate  $p$ th order VECM as follows:

$$\begin{aligned} \begin{bmatrix} \Delta \ln Y_t \\ \Delta \ln D_t \end{bmatrix} &= \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} + \sum_{i=1}^p (1-L) \begin{bmatrix} \beta_{11i} & \beta_{12i} \\ \beta_{21i} & \beta_{22i} \end{bmatrix} \begin{bmatrix} \Delta \ln Y_{t-i} \\ \Delta \ln D_{t-i} \end{bmatrix} \\ &+ \begin{bmatrix} \phi_1 \\ \phi_2 \end{bmatrix} [ECM_{t-1}] + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{bmatrix} \end{aligned} \quad (3)$$

Here,  $\ln Y$  and  $\ln D$  are as defined above,  $\alpha_1$  and  $\alpha_2$  denote constant drifts,  $(1-L)$  is the lag operator,  $ECM_{t-1}$  represents the one period lagged error-correction term derived from the cointegrating vector (this is omitted in the VAR model) and  $\varepsilon_{1t}$  and  $\varepsilon_{2t}$  are serially

independent random errors with mean zero and finite covariance matrix. The optimal lag length  $p$  is chosen on the basis of the Schwarz Bayesian Criterion.

Table 2 reports the results for the short run and long run Granger causality.<sup>4</sup> The  $t$ -statistics on the coefficients of the lagged error-correction terms indicate the significance of the long-run causal effects. The  $F$  tests on the explanatory variables indicate the significance of the short-run causal effects. Beginning with the long-run results, the coefficient on the one period lagged error correction term is statistically significant with a negative sign in the real GDP equation for Botswana and Gabon. This result implies that for these countries, in the long run, democracy Granger causes real GDP. Turning to the democracy equations we find that the coefficient on the one period lagged error correction term is statistically significant with a negative sign for Botswana, Chad, Cote d'Ivoire, Democratic Republic of Congo, Niger and Kenya. Thus, we conclude that in the long run real GDP Granger causes democracy in these countries.

In terms of the short-run results, democracy is statistically significant in the real GDP equation for Botswana, Burundi, Ghana and the Republic of Congo. This implies that in the short run democracy Granger causes real GDP in these countries. In the democracy equation, we find that income is statistically significant for Senegal and Zimbabwe. This implies that in the short run real GDP Granger causes democracy in these countries. For the other countries there is neutrality between democracy and real GDP.

### 3.6 Sensitivity Analysis using the Beck *et al.* (2001) Database

As a check on the sensitivity of the findings using the Freedom House data on democracy, we reconsidered the findings using data from the comparative political economy database of political institutions published in the World Bank Economic Review (Beck *et al.*, 2001) and downloadable from the World Bank website. This dataset has time series data for a range of political variables for the period 1975 to 2000. As our measure of democracy we use the LIEC which is one of the broadest measures of democracy in the Beck *et al.* dataset. The LIEC is on a seven point scale where 1 is no legislature; 2 is an unelected legislature; 3 is an elected legislature, but only one candidate; 4 is an elected legislature where there are multiple candidates from the same party; 5 is multiple parties are legal, but only one party won seats; 6 is multiple parties did win seats, but the largest party won more than 75% of seats and 7 is multiple parties won seats and the largest party won less than 75% of the seats.

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 Insert Tables 3 and 4  
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Table 3 presents the results of the ADF unit root test for the LIEC and GDP variables for each country for 1975 to 2000 and Table 4 presents the findings for the bounds test for cointegration, long-run elasticities and Granger causality.<sup>5</sup> The bounds test suggests there is a long-run relationship between LIEC and GDP for 13 countries (Madagascar, Rwanda, Republic of Congo, Mauritius, Botswana, Gabon, Cameroon, Cote d'Ivoire, Niger, Sierra Leone, South Africa, Swaziland and Nigeria), which is four more than when we use the Freedom House dataset. There are six countries for which there is a long-run



relationship between the democracy variable and GDP using the Beck *et al.* (2001) and Freedom House datasets (Botswana, Gabon, Cote d'Ivoire, Niger, Rwanda and Nigeria).

There is long-run Granger causality running from LIEC to GDP in Madagascar, Rwanda, Mauritius, Sierra Leone, South Africa and Swaziland. There is long-run Granger causality running from GDP to LIEC in Botswana, Gabon, Cameroon, Cote d'Ivoire, Niger and Nigeria. There is long-run neutrality between LIEC and GDP when LIEC is the dependent variable in Madagascar and the Republic of Congo and long-run neutrality between GDP and LIEC when GDP is the dependent variable in Nigeria. An increase in LIEC generates an increase in GDP in Madagascar, Rwanda, South Africa and Swaziland and a fall in GDP in Nigeria and Sierra Leone. An increase in GDP generates an increase in LIEC in Botswana, Gabon, Cote d'Ivoire, Madagascar and Niger and a fall in LIEC in Nigeria. The results for the long-run elasticities are generally robust across long-run estimators, although the coefficient on the long-run variable for Botswana is statistically insignificant using dynamic OLS, while the long-run coefficient for Nigeria is only statistically significant with dynamic OLS and not with the other two estimators.

#### **4. Summary and Comparison of the Results**

Table 5 presents a summary and comparison of the results using the Freedom House and Beck *et al.* (2001) datasets for Granger causality and the long-run elasticities. The Lipset hypothesis will be supported if, in the long run, real GDP Granger causes democracy and an increase in GDP results in an improvement in democracy. There is support for the Lipset hypothesis for Botswana and Niger with both datasets, for Chad with the Freedom House data only and for Cote d'Ivoire and Gabon with the LIEC dataset only. These

results provide strong support for the Lipset hypothesis in Botswana and Niger and mixed support for the Lipset hypothesis in Chad, Cote d'Ivoire and Gabon; however, there is no support for the Lipset hypothesis in other SSA countries. Taking the two datasets together, in addition to Botswana, Niger, Chad, Cote d'Ivoire and Gabon there are four other countries for which either dataset suggests real GDP Granger causes democracy in the long run – two with the Freedom House data (Democratic Republic of Congo and Kenya) and two with the Beck *et al.* (2001) data (Cameroon and Nigeria). Of these, in Kenya, the Democratic Republic of Congo and Nigeria, the long-run estimators with the relevant data base suggest that an increase in GDP has a negative effect on democracy.

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Insert Table 5

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We now turn to the compatibility, conflict and skeptical hypotheses. There will be support for the compatibility hypothesis if, in the long run, democracy Granger causes real GDP and an increase in democracy results in an improvement in real GDP. There will be support for the conflict hypothesis if, in the long run, democracy Granger causes real GDP and an increase in democracy has a negative effect on real GDP. With the Freedom House data, the result for Botswana is consistent with the compatibility hypothesis and the result for Gabon is consistent with the conflict hypothesis. With the Beck *et al.* (2001) dataset, the results for Madagascar, Rwanda, South Africa and Swaziland are consistent with the compatibility hypothesis and the result for Sierra Leone is consistent with the conflict hypothesis. Thus, of those countries where democracy Granger causes real GDP in the long run, there is more support for the compatibility hypothesis than the conflict hypothesis based on Beck *et al.*'s (2001) data. However,

overall, the small proportion of countries for which democracy Granger causes real GDP with either dataset lends support to the skeptical hypothesis that there is no systematic relationship between democracy and real GDP for the vast majority of countries.

Why do the results from the two datasets differ, and given that there are relatively few countries for which the results overlap, which set of results are more reliable? The LIEC database suggests a long-run relationship between democracy and real GDP for more countries than the Freedom House database. While the Freedom House and LIEC datasets suggest long-run and short-run Granger causality running from real GDP to democracy for the same number of countries, the LIEC database suggests democracy Granger causes real GDP for a larger number of countries in the long run than the Freedom House data while the reverse is true in the short run. A tentative explanation for this result rests with the nature of the two datasets. The measurement of democracy in the Beck *et al.* (2001) dataset is based purely on the nature and composition of the legislature, while Freedom House considers both political and civil rights in constructing their index. Political rights include the right to vote and compete for public office while civil rights include freedom to develop opinions, institutions and personal autonomy without interference from the state. Of the components of democracy, changes in the nature of the legislature, as a fundamental political institution, are likely to have the largest effect on the long-run economic growth path. The other factors, such as freedom of the media and right to express an opinion, which are captured in the Freedom House data, but not the Beck *et al.* database, are more short-run phenomena and, as such, more subject to change even without a change in the nature and composition of the legislature. For example, over a period of time a dictatorship might ease restrictions on civil rights allowing a moderate

level of freedom of expression and then crack down on civil rights again in response to protests for political change. These components of civil rights will have more effect on real GDP in the short run. Thus, the LIEC database suggests democracy has a stronger effect on real GDP in the long run, while the Freedom House data suggests democracy has a stronger effect on real GDP in the short run.

Of the two datasets, we prefer the results from the Freedom House data to the Beck *et al.* (2001) data on both conceptual and statistical grounds. On conceptual grounds, in our view, the measurement of democracy in the Freedom House dataset is superior. In assigning a value for civil and political rights Freedom House conducts an extensive review of primary and secondary sources including consultation with informed observers on the ground. While this extensive review process means necessarily that the Freedom House ratings are more subjective, they are also more comprehensive as a measure of democracy. From a statistical point of view, while the bounds test has superior properties in small samples relative to other tests for cointegration, in order to test for long-run relationships, it is preferable to have the longest time series possible. The Freedom House dataset has a slightly longer duration (1972–2001) than the Beck *et al.* (2001) dataset (1975–2000). Because the Freedom House dataset is more detailed in picking up nuances in differences in rights across countries which extend beyond the composition of the legislature, it potentially has more variance than the Beck *et al.* (2001) data.

## **5. Discussion of the Results**

In the results using the Freedom House dataset, Botswana stands out as the one country where there is support for both the compatibility and Lipset hypotheses, i.e. there is bivariate Granger causality between democracy and real GDP in the long run, and

democracy and real GDP have a positive effect on each other. The results using the Beck *et al.* (2001) dataset confirm long-run Granger causality running from GDP to democracy and that GDP has a positive effect on democracy. These findings suggest that democracy and economic growth in Botswana have been complementary and reinforcing. The democracy growth nexus is well established in Botswana. The OECD (1999, p. 129) posited: “Political stability has resulted from...favourable economic conditions”. While this is true, Botswana’s economic success has also been built on a democratic tradition in which there are no narrow ethnic-based interest groups with distinct means of expression, which has avoided infighting over diamonds and other political issues (Wiseman, 1990).

Botswana has been described as ‘an African success story’ (Acemoglu *et al.*, 2001) with the highest growth rate of any country in the world between 1960 and 1999. From 1965 to 1973 Botswana’s annual rate of growth of GDP was 14.8% which was the highest in the world except for the high income oil rich Oman (21.9%). From 1973 to 1984 Botswana’s annual growth rate was 10.7% which was the highest in the world, outstripping Asian Tigers, Hong Kong (9.1%) and Singapore (8.2%) (World Bank, 1986). Between 1980 and 1990 Botswana grew at 11%, also the highest in the world over this period, with China second at 10.3% per annum. From 1990 to 2003 Botswana’s growth slowed to 5.2%, but was still in the top dozen countries in the World Bank World Development Indicators list of countries over this period (World Bank, 2005). Botswana is one of only a few African countries with a democratic tradition (Wiseman, 1990). It has had continuous democracy since obtaining independence in 1966. The discovery of diamond mines has facilitated economic growth, but there is more to Botswana’s success than simply having abundant natural resources. There is universal agreement that the

Botswana government has used the revenue from diamonds to pursue good policies (see e.g. Acemoglu *et al.*, 2001). The OECD (1999, p. 129) suggested:

“Unlike many other developing countries facing commodity booms, the government maintained conservative economic policies rather than raising its spending to unsustainable levels and thus generated economic stability which created a favourable environment for domestic and foreign investment”.

Niger is the other country for which there is support for the Lipset hypothesis with both datasets. In the post independence period from 1960 to 1974 groundnuts was the leading export product, accounting for more than 50% of GDP. Because of severe droughts in 1968-69 and 1973-74, the role of groundnuts in the agricultural sector collapsed. The declining economic performance following the 1973-74 droughts resulted in deteriorating governance with the army taking advantage of the economic and social problems generated by the drought to launch a coup d'état in 1974 (Mamadou and Yakoubou, 2001). After 1975 uranium supplemented groundnuts as Niger's major export product. The uranium boom resulted in real GDP growth of 10.2% per annum between 1976 and 1979. In the first half of the 1980s uranium export revenues began to fall as a result of a decline in the demand and price for uranium. Between 1980 and 1984 real GDP declined 4% per annum. In the second half of the 1980s a Structural Adjustment Program was initiated with assistance from the IMF and World Bank. The main objectives of the Structural Adjustment Program were to improve public sector management and economic liberalization. As a result of the economic reforms, economic performance improved with real GDP growing at 3.5% per annum between 1985 and 1989. Improved economic performance acted as an impetus for political reform. Under pressure from the trade

unions and civil society, between 1990 and 1993 Niger revised its constitution to allow multiple political parties. Piecemeal political reforms occurred throughout the 1990s culminating in a coup in 1999 by Daouda Mallam Wanke who established a transitional National Reconciliation Council to oversee the drafting of a new constitution with a French style semi-presidential system. The electorate approved a new constitution in July 1999 in a vote judged by international observers to be fair and in November 1999, legislative and presidential elections were held (US Department of State, 2004).

For the other results we focus our discussion on the Freedom House results given that we have argued they are preferable on conceptual and statistical grounds to the results obtained with the LIEC dataset. The results for Chad with the Freedom House data support the Lipset hypothesis. Chad is one of the poorest countries in the world with the 2004 United Nations Human Development Index ranking Chad the 167<sup>th</sup> poorest country in the world (out of 177 countries). Poor economic conditions contributed to decades of civil war and successive coups where those who instigated the coup charged the incumbent government with failing to address poor economic and social conditions. In this manner disappointing economic results generated political instability and poor governance. When Idriss Deby launched a coup in 1990 his reasoning followed previous coups, accusing the Habre government of poor economic performance. While Deby has taken steps towards the establishment of an electoral democracy since 1990, the elections which have been held have not been free with Deby deploying security forces to intimidate opposition candidates and the electorate and forestalling widespread demonstrations (EIU, 2005). More generally, opposition groups claim that Deby has fostered government instability to undermine political accountability and maintain power.

As such, democracy in Chad is fledgling at best. Between 1990 and 1998 Chad had five prime ministers and 20 governments and one of Deby's own ministers, Youssef Togoimi, abandoned politics in favour of armed struggle (US Department of State, 2004).

In the Democratic Republic of Congo and Kenya with the Freedom House data Granger causes democracy in the long run and an increase in real GDP has a negative effect on democracy. In Kenya's case it can be argued that weaker economic performance has had a positive effect on political freedom. Kenya's economic performance in the 1980s and 1990s was poor relative to the 1960s and 1970s. In the years following independence Kenya achieved rapid economic growth. Between 1963 and 1973 GDP grew at 6.6% per annum and agricultural production grew at 4.7% per annum. Over the ensuing two decades economic performance has not been as good. Between the mid-1970s and mid-1990s Kenya had lower growth and limited economic transformation. Between 1975 and 1979 annual GDP growth was 2.2% per annum; between 1980 and 1984 annual GDP growth was -1.8%; between 1985 and 1989 annual GDP growth was 5.8% and between 1991 and 1995 annual GDP growth was 2.6% (World Bank, 2005). There was an elaborate system of state patronage under the Kenyatta regime, but it incorporated the leaders of most ethnic groups. At the same time semi-competitive regular elections helped to diffuse political conflict. As the OECD (1999a, p. 27) put it: "Provided one remained within the party ... and did not criticize the President, an individual politician had considerable freedom". In the 1980s Kenya under Moi was a single party state with widespread political repression. Following the end of the Cold War with Kenya reliant on lending agencies, foreign aid was withheld pending compliance with political reform. One of the key conditions imposed on the Moi regime was the restoration of a multiparty



democracy. There were elections in the 1990s which were marred by electoral fraud and political violence, but which Moi ultimately won because the opposition was divided.

Over the period studied, the Democratic Republic of Congo was a political dictatorship under Mobutu and then Kabila. The freedom of the press was curtailed, there was little or no tolerance of dissent and it had a poor human rights record (World Press Freedom Review, 2003). The findings for the Democratic Republic of Congo are surprising, though, in that the lack of democratic institutions did not result from higher economic growth because the Democratic Republic of Congo was, and still is, one of the poorest countries in the world with annual per capita income of \$US90 in 2002 (World Bank, 2003). The Democratic Republic of Congo does have much mineral wealth, suggesting it has considerable potential to increase GDP, but this was poorly managed under the Mobutu regime and in the 1990s there was a spill over of civil unrest from the war in Rwanda. Causation appeared to run from poor governance to low growth with Mobutu imposing prohibitive rates of taxation that acted as disincentives for work and made bribery and corruption pervasive and a necessity for private business. Public finances were dissipated into private consumption for Mobutu, his family and key offices within the state. A vast body of evidence suggests that Mobutu appropriated several hundred million dollars annually that belonged to the national treasury (see e.g. Moloki, 1997).

In Gabon the results using the Freedom House index and in Sierra Leone the results using the Beck *et al.* (2001) dataset indicate that long-run Granger causality runs from democracy to real GDP and that improvements in democracy have a negative effect on real GDP, consistent with the conflict hypothesis. This result is consistent with Collier

and Hoeffler's (2005) findings that in the presence of large rents from natural resources, autocracies outperform democracies. Gabon depends on oil reserves and Sierra Leone has extensive reserves of non-precious (bauxite, rutile) and precious (diamonds) minerals. Collier and Hoeffler (2005) found that in the absence of natural resource rents, a fully democratic polity outperforms a despotic autocracy by around 1.5 percentage points of growth per annum, but where natural resource rents are around 8% of GDP, in the absence of checks and balances, the growth advantage of democracy is eliminated.

## **6. Conclusion**

This paper has examined the relationship between democracy and real GDP in 30 SSA countries using Freedom House data over the period 1972–2001. We checked the sensitivity of our findings using the LIEC for the countries from the Beck *et al.* (2001) database for the period 1975-2000. We conclude by reiterating our results for the Lipset hypothesis as well as the competing hypotheses concerning the effect on democracy on economic growth. There is support for the Lipset hypothesis which proffers that real GDP Granger causes democracy and that an increase in real GDP has a positive effect on democracy in the long run for Botswana and Niger with both datasets, for Chad with the Freedom House data only and for Cote d'Ivoire and Gabon with the LIEC dataset only. These results provide strong support for the Lipset hypothesis in Botswana and Niger and mixed support for the Lipset hypothesis in Chad, Cote d'Ivoire and Gabon, but no support for the Lipset hypothesis in the remaining countries in the sample. In Kenya and the Democratic Republic of Congo with the Freedom House data and Nigeria with the LIEC dataset real GDP Granger causes democracy in the long run, but the long-run estimators indicate that an increase in real GDP has a negative effect on democracy.

Next, consider the compatibility, conflict and skeptical hypotheses which are competing hypotheses concerning the long-run effect of democracy on economic growth. There is support for the compatibility hypothesis, which states that in the long run democracy Granger causes real income and an increase in democracy has a positive effect on real income, for Botswana with the Freedom House dataset and for Madagascar, Rwanda, South Africa and Swaziland with the LIEC dataset. There is support for the conflict hypothesis, which states that in the long run democracy Granger causes real income and an increase in democracy has a negative effect on real income, for Gabon with the Freedom House data and Sierra Leone with the LIEC data. However, the fact that for most countries there is long run Granger neutrality between democracy and real GDP provides support to the skeptical hypothesis for the vast majority of the sample.

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Table 1: Unit Root Tests using Freedom House data

Country	ADF Test				Phillips-Perron Test					
	$\ln Y_t$	$\Delta \ln Y_t$	$\ln D_t$	$\Delta \ln D_t$	$\ln Y_t$	$\Delta \ln Y_t$	$\ln D_t$	$\Delta \ln D_t$	$\ln D_t$	$\ln Y_t$
Benin	-1.9108 [0]	-4.3991 [1]	-1.7193 [0]	-4.0864 [0]	-2.0593 [1]	-4.5857[4]	-1.8405 [0]	-4.0886 [1]	<i>I(1)</i>	<i>I(1)</i>
Botswana	-0.2629 [2]	-3.9216 [1]	-2.4964 [0]	-5.3798 [0]	-2.0838 [1]	-4.5679 [2]	-2.6078 [0]	-5.3798 [0]	<i>I(1)</i>	<i>I(1)</i>
Burkina Faso	-3.1050 [0]	-6.0294 [1]	-2.8122 [0]	-5.1324 [0]	-3.1606 [3]	-8.2286 [3]	-2.8165 [0]	-7.4694 [11]	<i>I(1)</i>	<i>I(0)</i>
Burundi	-0.5602 [0]	-4.3465 [0]	-3.9601 [0]	-6.7907 [0]	-0.7035 [2]	-4.3180 [5]	1.5914 [0]	-3.7124 [6]	<i>I(1)</i>	<i>I(1)</i>
Cameroon	-2.1757 [3]	-3.7420 [0]	-3.9601 [0]	-6.7707 [0]	-1.6512 [3]	-3.7446 [3]	-3.7124 [0]	-15.9138 [23]	<i>I(0)</i>	<i>I(1)</i>
Central Africa	-2.6149 [0]	-5.8948 [0]	-1.8017 [0]	-3.9500 [0]	-2.6149 [0]	-5.9238 [3]	1.8017 [0]	-3.9500 [0]	<i>I(1)</i>	<i>I(1)</i>
Chad	-5.1887 [8]	-5.2010 [0]	-4.3388 [0]	-5.3479 [2]	-2.3018 [2]	-5.2010 [0]	-4.2831 [0]	-17.7210 [14]	<i>I(0)</i>	<i>I(1)</i>
Congo – B	-1.7877 [0]	-2.5085 [0]	-1.8955 [0]	-4.9257 [0]	-1.3101 [2]	-2.5085 [0]	-2.0317 [1]	-4.9259 [1]	<i>I(1)</i>	<i>I(2)</i>
Congo – K	-1.1831 [1]	-2.8639 [0]	-2.8638 [0]	-4.9272 [1]	-1.4394 [2]	-2.8665 [1]	-2.8057 [2]	-6.1437 [11]	<i>I(1)</i>	<i>I(1)</i>
Cote d'Ivoire	-2.2758 [0]	-3.0127 [4]	-2.0718 [0]	-3.5336 [2]	-2.3979 [2]	-3.2301 [2]*	-1.9044 [0]	-3.5432 [11]	<i>I(1)</i>	<i>I(1)</i>
Gabon	-3.2752 [0]	-3.8582 [0]	-2.4202 [0]	-5.0284 [0]	-3.2699 [6]	-3.6508 [8]	-2.2549 [0]	-8.1191 [27]	<i>I(1)</i>	<i>I(0)</i>
Gambia	-4.1605 [1]	-5.7087 [1]	-2.2579 [0]	-4.2894 [0]	-6.1537 [9]	-4.8015 [11]	-2.2579 [0]	-4.2015 [2]	<i>I(1)</i>	<i>I(0)</i>
Ghana	-1.8754 [1]	-4.4618 [0]	-1.8630 [0]	-2.6873 [6]	-1.1873 [12]	-4.6649 [12]	-1.9936 [0]	-4.7737 [12]	<i>I(1)</i>	<i>I(1)</i>
Kenya	-0.6573 [2]	-3.7019 [0]	-3.7275 [0]	-5.3639 [0]	-0.3114 [4]	-2.0709 [6]	-2.8857 [0]	-11.2158 [27]	<i>I(1)</i>	<i>I(1)</i>
Lesotho	-2.8658 [0]	-4.9880 [0]	-3.4747 [0]	-7.3540 [0]	-2.4876 [9]	-7.9647 [27]	-3.5671 [2]	-8.0581 [4]	<i>I(0)</i>	<i>I(1)</i>
Madagascar	-1.3381 [0]	-5.2099 [8]	-2.0905 [0]	-5.6748 [0]	-1.2336 [3]	-6.8165 [12]	-2.0313 [0]	-5.6792 [1]	<i>I(1)</i>	<i>I(1)</i>
Malawi	-3.1295 [0]	-7.3576 [0]	-1.8719 [0]	-4.8845 [0]	-3.0856 [3]	-7.8591 [7]	-2.0958 [0]	-4.8848 [1]	<i>I(1)</i>	<i>I(0)</i>
Mali	-1.6000 [0]	-2.9753 [4]	-2.1720 [0]	-5.2684 [0]	-1.7756 [1]	4.4954 [3]	-2.2393 [0]	-5.2829 [4]	<i>I(1)</i>	<i>I(1)</i>
Mauritius	-4.3145 [0]	-4.8092 [7]	-2.0257 [1]	-10.7408 [0]	-2.6840 [3]	-5.1277 [0]	-4.3142 [3]	-11.2797 [3]	<i>I(0)</i>	<i>I(1)</i>
Niger	-2.7040 [6]	-6.0699 [0]	-4.2683 [2]	-3.5961[7]	-2.9213 [2]	-5.9887 [1]	-2.0395 [11]	-7.5602 [27]	<i>I(1)</i>	<i>I(1)</i>
Nigeria	-2.3361[6]	-3.0088 [3]	-1.9862 [0]	-4.1855 [5]	-1.7703 [4]	-5.2642 [4]	-1.9862 [0]	-4.6882 [2]	<i>I(1)</i>	<i>I(1)</i>
Rwanda	-2.1524 [0]	-5.5007 [0]	-1.5487 [0]	-5.3920 [0]	-2.1524 [0]	-5.5452 [3]	-1.4907 [3]	-5.5820 [5]	<i>I(1)</i>	<i>I(1)</i>
Senegal	-2.2430 [0]	-5.5300 [1]	-1.7291 [0]	-4.6656 [0]	-2.4108 [1]	-5.6759 [1]	-1.7291[0]	-4.6531 [2]	<i>I(1)</i>	<i>I(1)</i>
Sierra Leone	-1.5189 [0]	-6.0466[0]	-3.9530 [5]	-9.1676 [0]	-1.4289 [4]	7.1699 [10]	-3.8618 [3]	-9.9216 [2]	<i>I(0)</i>	<i>I(1)</i>
South Africa	-3.6079 [1]	-4.1566 [0]	-1.5367 [1]	-4.3777 [0]	-3.2739 [5]	-4.7488 [16]	-2.3619 [2]	-4.4057 [6]	<i>I(1)</i>	<i>I(0)</i>
Sudan	-0.6397 [0]	-3.3701 [0]	-2.5180 [0]	-5.0408 [0]	-0.9713 [1]	-3.3116 [4]	-2.0963 [12]	-8.3477 [4]	<i>I(1)</i>	<i>I(1)</i>
Swaziland	-1.7372 [0]	-5.0153 [0]	-3.8433 [0]	-9.0254 [0]	-1.8344 [1]	-5.0149 [1]	-4.0857 [3]	-9.3198 [2]	<i>I(1)</i>	<i>I(0)</i>
Togo	-3.1022 [1]	-5.5158 [0]	-2.8146 [0]	-6.8079 [0]	-2.7242 [5]	-7.4210 [8]	-2.8149 [0]	-7.2523 [6]	<i>I(1)</i>	<i>I(1)</i>
Zambia	-3.9471 [0]	-5.0616 [1]	-2.4481 [0]	-5.0131 [0]	-3.7837 [5]	-12.1123 [18]	-2.5862 [1]	-5.3293 [6]	<i>I(1)</i>	<i>I(0)</i>
Zimbabwe	-1.7410 [0]	-3.7083 [0]	-6.7041 [7]	-3.5351 [0]	-2.0901 [3]	-3.4918 [4]	-1.8589 [2]	-3.3293 [10]	<i>I(1)</i>	<i>I(1)</i>

Notes: For the levels series the critical values at the 1% and 5% levels of significance are -3.6793 and -2.9677 respectively. For the first differenced series the corresponding critical values are -3.6892 and -2.9719. Congo-B and Congo-K refer to Democratic Republic of Congo and Republic of Congo respectively as per the nomenclature used in the World Bank World Tables. Lag lengths are in parenthesis.



Table 2: Tests for cointegration and long-run elasticities using Freedom House data

Dependent variable	F-Test		Granger Causality tests			Long-run elasticities (D-) <sup>1</sup>		
Country	$F_Y(Y D)$	$F_D(D Y)$	$Y \Rightarrow D$ [prob.]	$D \Rightarrow Y$ [prob.]	$ECT_{t-1}$ (t-statistics)	Dynamic OLS (t-statistics)	Phillip- Hansen (t-statistics)	Engle- Granger (t-statistics)
Botswana <sup>2</sup>	8.1124	-	-	3.0889*** [0.0657]	-0.0327* (-4.7359)	0.6012*** (1.7053)	-	1.0246** (2.0040)
Botswana <sup>3</sup>	-	3.9348	0.1270 [0.8814]	-	-0.2799* (-2.0399)	0.2701*** (1.7053)	-	0.1224** (2.0040)
Benin	1.1505	0.7831	0.3013 [0.5879]	0.0274 [0.8698]	-	-	-	-
Burkina Faso	1.5775	1.7452	-	-	-	-	-	-
Burundi	1.9061	2.1965	0.8236 [0.4519]	3.1870*** [0.0609]	-	-	-	-
Cameroon	3.7097	2.9552	-	-	-	-	-	-
Central Africa	2.3327	0.7076	1.4138 [0.2644]	1.6261 [0.2195]	-	-	-	-
Chad	0.5379	12.9579	-	-	-0.7794* (-4.2668)	0.2254* (6.0530)	-	-
Congo – B	1.0446	3.9734	-	-	-0.4257** (-2.1820)	-0.8132** (-2.3223)	-	-
Congo – K	0.8387	2.1030	0.0360 [0.8511]	3.6134*** [0.0689]	-	-	-	-
Cote d'Ivoire	3.1863	6.3447	2.3924 [0.1345]	1.1966 [0.2844]	-0.1175** (-2.3470)	-0.6056 (-0.7969)	0.1645 (0.2248)	0.2677 (0.4942)
Gabon	4.0849	2.0057	-	-	-0.4080* (-3.8109)	-0.4066* (-3.7570)	-	-
Gambia	1.2402	1.9368	-	-	-	-	-	-
Ghana	1.3253	1.7487	1.1226 [0.3434]	2.5703*** [0.0993]	-	-	-	-
Kenya	2.1983	4.7598	1.8983 [0.1736]	0.1136 [0.8931]	-0.6987* [-3.9017]	-0.4053* (-4.3944)	-0.2567* (-3.5401)	-0.2344* (-4.0447)
Lesotho	0.5594	2.2437	-	-	-	-	-	-
Madagascar	2.1124	2.4476	1.7126 [0.2036]	2.2290 [0.1314]	-	-	-	-

Table 2 continued:

Dependent variable	F-Test		Granger Causality tests			Long-run elasticities		
Country	$F_Y(Y D)$	$F_D(D Y)$	$Y \Rightarrow D$ [prob.]	$D \Rightarrow Y$ [prob.]	$ECT_{t-1}$ (t-statistics)	Dynamic OLS (t-statistics)	Phillips- Hansen (t-statistics)	Engle- Granger (t-statistics)
Malawi	1.8992	2.3875	-	-	-	-	-	-
Mali	3.3518	1.9262	0.5540 [0.6366]	0.4610 [0.6366]	-	-	-	-
Mauritius	0.0518	1.6083	-	-	-	-	-	-
Niger	1.8689	5.0162	0.1487 [0.8626]	0.85559 [0.4387]	-0.3102** (-2.0747)	1.5668* (2.8693)	0.9310*** (1.7843)	0.6779*** (1.8000)
Nigeria	8.8593	1.0360	1.4005 [0.2676]	0.1599 [0.8533]	-0.2264 (-1.6571)	-0.3507** (-2.9329)	-0.1502 (-1.2332)	-0.0751 (-0.8881)
Rwanda	481.7300	0.0638	0.3696 [0.5487]	0.4240 [0.5209]	-0.1261 (-1.0632)	1.7340* (2.7973)	1.7296** (2.3130)	1.9518* (3.7462)
Senegal	0.5726	2.8764	3.1070*** [0.0640]	0.0396 [0.9612]	-	-	-	-
Sierra Leone	2.9293	2.0139	-	-	-	-	-	-
South Africa	0.9244	0.80645	-	-	-	-	-	-
Sudan	1.6661	3.3276	0.0145 [0.9856]	0.1043 [0.9014]	-	-	-	-
Swaziland	2.5257	3.0359	-	-	-	-	-	-
Togo	0.8066	1.1048	1.1796 [0.3261]	0.0644 [0.9378]	-	-	-	-
Zambia	1.1613	3.3054	-	-	-	-	-	-
Zimbabwe	1.0001	2.8650	2.6599*** [0.0923]	0.3998 [0.6752]	-	-	-	-

Table 2 continued:

'Exact' Critical Values for Bounds Test				
$k=1$	90% critical value bounds		95% critical value bounds	
$T$	I(0)	I(1)	I(0)	I(1)
30	3.303	3.797	4.090	4.663

Notes: \*(\*\*)\*\* denotes statistical significance at the 1%, 5% and 10% levels respectively. The t-statistics for the long-run Granger causality results and for the long-run elasticities are in parenthesis while the probability values for the short-run Granger causality results are in square brackets.

<sup>1</sup> Because the Freedom House data is scaled 1=most democratic to 7=least democratic, a negative coefficient with that dataset implies a positive relationship between democracy and economic growth. To make the results easier to read, and to be consistent with the Beck *et al* (2001) results in Table 4, D- indicates the sign has been changed. Thus, in the reported results, a positive coefficient means that there is a positive relationship between democracy and economic growth.

<sup>2</sup> denotes model where GDP is the dependent variable.

<sup>3</sup> denotes model where democracy is the dependent variable.

Table 3: ADF Unit Root Test using the Beck *et al.* (2001) dataset

Country	ADF test				Order of Integration	
	$\ln Y_t$	$\Delta \ln Y_t$	$\ln D_t$	$\Delta \ln D_t$	$\ln Y_t$	$\ln D_t$
Benin	-1.6162 (0)	-3.8027(1)	-2.5124(0)	-4.9568(0)	I(1)	I(1)
Botswana	-1.0219(1)	-3.7272(1)	0.9818 (0)	N.A	I(1)	I(1)
Burkina Faso	-3.1050(0)	-6.0294(1)	-2.2714(0)	-4.6467(0)	I(1)	I(1)
Burundi	-0.9220(0)	-4.0690(0)	-2.2611(0)	-4.6885(0)	I(1)	I(1)
Cameroon	-1.9350(1)	-3.7420(0)	-2.3003(2)	-2.0842(1)	I(1)	I(1)
Central Africa	-2.6149(0)	-5.8948(0)	-2.2250(0)	-4.7913(0)	I(1)	I(1)
Chad	-2.0425(0)	-4.8537(0)	-2.7740(0)	-4.8448(1)	I(1)	I(1)
Congo-K <sup>a</sup>	-0.9150(0)	-2.7768(0)	-3.8160(0)	-6.8011(0)	I(2)	I(1)
Cote d'Ivoire <sup>a</sup>	-2.0092(0)	-1.6572(4)	-2.0766(0)	-4.8141(0)	I(0)	I(1)
Gabon	-2.3544(0)	-6.1655(0)	-2.1719(0)	-4.9029(0)	I(1)	I(1)
Gambia <sup>a</sup>	-5.6873(1)	-7.2532(1)	-1.7439(0)	-4.9477(0)	I(0)	I(1)
Ghana <sup>a</sup>	-4.3641(7)	-4.4618(0)	-2.247(0)	-4.732(1)	I(0)	I(1)
Kenya <sup>a</sup>	-0.8923(2)	-2.8542(1)	-1.5892(0)	-4.8133(0)	I(2)	I(1)
Lesotho	-2.5612(0)	-4.9568(0)	-1.4816(0)	-4.8268(1)	I(1)	I(1)
Madagascar	-1.4419(0)	-4.6878(0)	-2.1917(0)	-1.2949(5)	I(1)	I(1)
Malawi	-3.2473(0)	-6.9121(0)	-2.2031(1)	-3.6997(0)	I(1)	I(1)
Mali	-1.4376(0)	-4.5344(4)	-3.3515(0)	-6.9235(0)	I(1)	I(0)
Mauritius <sup>a</sup>	-5.377(5)	-5.7365(0)	-4.9914(0)	-7.9442(0)	I(0)	I(1)
Niger	-2.1502(0)	-4.0283(0)	-1.9249(0)	-5.1526(0)	I(1)	I(1)
Nigeria	-3.3898(3)	-2.6928(3)	-2.8603(0)	-5.8216(0)	I(1)	I(1)
Rwanda	-2.5395(0)	-5.0741(0)	-1.3049(0)	-5.3062(5)	I(1)	I(1)
Senegal	-2.0905(0)	-5.4529(1)	-3.9368(0)	-5.4560 (0)	I(1)	I(1)
Sierra Leone	-1.1924(0)	4.3017(2)	-5.3493 (3)	-5.4364(3)	I(1)	I(1)
South Africa	-2.9084(1)	-3.9989(0)	-2.4337(0)	-4.7958(3)	I(1)	I(1)
Sudan	(-0.2971)0	(-4.7563)0	2.1997(0)	-4.3958(0)	I(1)	I(1)
Swaziland	-2.1712(0)	-4.3654(0)	-1.9389(0)	-4.8817(0)	I(1)	I(1)
Togo	-3.1695(1)	-5.1294(0)	-2.2862(0)	-5.1948(0)	I(1)	I(1)
Zambia	-3.5021(0)	-4.9176(1)	-2.0238(0)	-4.8428(0)	I(1)	I(1)
Zimbabwe	-3.7086(1)	-4.0141(5)	-4.9034(0)	-9.0117(0)	I(0)	I(0)

Notes: Critical Values for differenced variables are -4.4163, -3.6220 and -3.2486 and for levels variables -4.3743, -3.6032 and -3.2381 at 1%, 5% and 10 % level respectively. Lag lengths are in parentheses. (a) – The Phillips-Perron test suggests income in these countries is I(1).

Table 4: Tests for cointegration and long-run elasticities using the Beck *et al.* (2001) dataset

Country	F-Test		Granger Causality			Long-run Elasticities		
	$F_Y(Y D)$	$F_D(D Y)$	$ECT_{t-1}$ (t-statistics)	$Y \Rightarrow D$ [prob.]	$D \Rightarrow Y$ [prob.]	Dynamic OLS (t-statistics)	Phillip-Hansen (t-statistics)	Engle-Granger (t-statistics)
Benin	1.3131	1.2785	-	0.3234 [0.7278]	0.3270 [0.7253]	-	-	-
Botswana	1.0682	4.2544	-0.0332* (-2.7958)	0.9568 [0.4028]	2.5554 [0.1055]	-0.0011 (-0.0005)	5.9959* (2.7954)	5.8934* (3.9174)
Burkina Faso	1.3491	0.7948	-	1.8722 [0.1841]	0.0705 [0.932]	-	-	-
Burundi	0.8575	1.8044	-	0.5773 [0.5715]	0.7914 [0.4684]	-	-	-
Cameroon	0.4292	3.9331	-0.1845* (-3.7194)	0.6306 [0.5443]	1.5816 [0.2345]	0.1259 (0.5510)	0.2434 (0.9663)	0.2401 (1.2920)
Central Africa	1.1285	0.9931	-	1.1378 [0.3425]	3.0810*** [0.0707]	-	-	-
Chad	0.5927	1.4260	-	1.1565 [0.3369]	0.7380 [0.4920]	-	-	-
Congo-K	9.608	-	-0.8305 (-1.5637)	-	-	0.0507 (0.6421)	-	-
Cote d'Ivoire	0.2626	4.1068	-0.2076*** (-1.9242)	0.1015 [0.9040]	0.2580 [0.7754]	0.4004* (4.1622)	0.4782* (4.3397)	0.4447* (4.6897)
Gabon	0.3744	5.1528	-0.7026* (-5.1687)	1.0103 [0.3839]	0.3458 [0.7123]	0.4509* (7.7238)	0.3987* (4.9738)	0.3630* (5.4238)
Gambia	0.6092	1.8224	-	-	-	-	-	-
Ghana	1.3968	1.7417	-	0.4713 [0.6317]	0.7299 [0.4957]	-	-	-
Kenya	1.4204	0.9121	-	0.2985 [0.7455]	0.8674 [0.4369]	-	-	-
Lesotho	0.5742	1.9386	-	0.0518 [0.9496]	0.0668 [0.9356]-	-	-	-
Madagascar <sup>1</sup>	3.7759	-	-0.2605* (-2.5141)	2.1584 [0.1445]	-	0.1535** (2.3575)	0.0911** (2.3670)	0.0802* (3.2807)
Madagascar <sup>2</sup>	-	13.2605	-0.0142 (-0.1169)	-	0.9826 [0.3936]	2.1857** (2.3573)	3.3437** (2.3137)	3.8612* (3.2807)

Table 4 continued:

Country	F-Test		Granger causality			Long-run Elasticities		
	$F_Y(Y D)$	$F_D(D Y)$	$ECT_{t-1}$ (t-statistics)	$Y \Rightarrow D$ [prob.]	$D \Rightarrow Y$ [prob.]	Dynamic OLS (t-statistics)	Phillip-Hansen (t-statistics)	Engle-Granger (t-statistics)
Malawi	0.7253	1.4447	-	1.4541 [0.2598]	0.1202 [0.8875]	-	-	-
Mali	1.1146	3.0889	-	-	-	-	-	-
Mauritius	4.1186	1.6787	-1.0000 (none)	-	-	0.0092 (0.9822)	-	-
Niger	0.0364	6.9659	-0.4173* (-2.9376)	0.0882 [0.9163]	0.3325 [0.7215]	0.0808* (4.9412)	0.0966* (4.2369)	0.0937* (4.6199)
Nigeria <sup>1</sup>	4.7320	-	2.6316 (-0.5502)	4.1538** [0.0340]	-	-0.3664* (-3.4298)	-0.1132 (-1.5617)	-0.0520 (-1.0985)
Nigeria <sup>2</sup>	-	3.8280	-0.0477* (-2.9376)	-	1.0498 [0.3716]	-1.4752* (-3.4291)	-0.8601 (-1.1169)	-0.9587 (-1.0985)
Rwanda	3.8760	0.3682	-0.7286* (-3.9269)	0.2896 [0.6789]	0.4598 [0.8765]	0.6238* (5.2313)	0.9311* (4.7866)	0.8974* (4.1222)
Senegal	2.2171	1.6101	-	-	-	-	-	-
Sierra Leone	5.1293	2.6787	-0.4003* (-2.4477)	1.0737 [0.3627]	0.4565 [0.6406]	-2.6548* (-2.6166)	-0.5167* (3.5906)	-1.8911** (-1.9790)
South Africa	5.708	0.3973	-0.2962* (-2.5156)	1.8540 [0.1853]	0.5799 [0.5701]	0.6770* (5.4132)	0.3430** (2.0972)	0.2494** (2.1539)
Sudan	0.1735	5.3618	0.0910*** (1.9156)	0.0690 [0.9336]	1.2214 [0.3181]	0.0552 (0.4934)	-0.1154 (-1.0303)	-
Swaziland	5.3618	0.1735	-0.2435*** (-1.8747)	0.0265 [0.9739]	0.2055 [0.8192]	1.6470* (8.6098)	0.4951* (4.3742)	1.2972* (6.1135)
Togo	2.7600	1.6228	-	0.0605 [0.9414]	0.2917 [0.7505]	-	-	-
Zambia	0.7849	2.5205	-	8.9101* [0.0020]	0.0461 [0.9550]	-	-	-
Zimbabwe	0.86752	2.0930	-	0.4306 [0.6563]	0.8370 [0.4484]	-	-	-

Notes: (\*\*)\*\* denotes statistical significance at the 1%, 5% and 10% levels respectively. The t-statistics for the long-run Granger causality results and for the long-run elasticities are in parenthesis while the probability values for the short-run Granger causality results are in square brackets. <sup>1</sup> denotes model where GDP is the dependent variable. <sup>2</sup> denotes model where democracy is the dependent variable.

Table 5: Summary and Comparison of the Results using the Beck *et al.* (2001) and Freedom House datasets

Country	Granger Causality				Long-Run Elasticities	
	Long-Run		Short-Run		Freedom House <sup>(e)</sup>	LIEC <sup>(d)</sup>
	Freedom House	LIEC	Freedom House	LIEC		
Benin						
Botswana	$Y \Rightarrow D^{(a)}$ $D \Rightarrow Y^{(b)}$	$Y \Rightarrow D$	$D \Rightarrow Y$		$D \rightarrow Y^{(e)}$ 0.60 to 1.02 $Y \rightarrow D^{(f)}$ 0.12 to 0.27	$Y \rightarrow D$ 5.9 to 6.00
Burkina Faso						
Burundi			$D \Rightarrow Y$			
Cameroon		$Y \Rightarrow D$				
Chad	$Y \Rightarrow D$				$Y \rightarrow D$ 0.22	
Central Africa				$D \Rightarrow Y$		
Congo – B	$Y \Rightarrow D$				$Y \rightarrow D$ -0.81	
Congo – K			$D \Rightarrow Y$			
Cote d'Ivoire	$Y \Rightarrow D$	$Y \Rightarrow D$				$Y \rightarrow D$ 0.40 to 0.48
Gabon	$D \Rightarrow Y$	$Y \Rightarrow D$			$D \rightarrow Y$ -0.41	$Y \rightarrow D$ 0.36 to 0.40
Gambia						
Ghana			$D \Rightarrow Y$			
Kenya	$Y \Rightarrow D$				$Y \rightarrow D$ -0.23 to -0.41	
Lesotho						
Madagascar		$D \Rightarrow Y$				$D \rightarrow Y$ 0.08 to 0.15 $Y \rightarrow D$ 2.18 to 3.86
Malawi						
Mali						
Mauritius		$D \Rightarrow Y$				
Niger	$Y \Rightarrow D$	$Y \Rightarrow D$			$Y \rightarrow D$ 0.68 to 1.57	$Y \rightarrow D$ 0.08 to 0.10
Nigeria		$Y \Rightarrow D$		$Y \Rightarrow D$	$D \rightarrow Y$ -0.35	$D \rightarrow Y$ -0.37 $Y \rightarrow D$ -1.48
Rwanda		$D \Rightarrow Y$			$D \rightarrow Y$ 1.73 to 1.95	$D \rightarrow Y$ 0.6 to 0.9
Senegal			$Y \Rightarrow D$			
Sierra Leone		$D \Rightarrow Y$				$D \rightarrow Y$ -0.52 to -2.66
South Africa		$D \Rightarrow Y$				$D \rightarrow Y$ 0.25 to 0.68
Sudan						
Swaziland		$D \Rightarrow Y$				$D \rightarrow Y$ 0.50 to 1.65
Togo						
Zambia				$Y \Rightarrow D$		
Zimbabwe			$Y \Rightarrow D$			

Notes:

(a)  $Y \Rightarrow D$  means Granger causality runs from GDP to democracy.(b)  $D \Rightarrow Y$  means Granger causality runs from democracy to GDP.To make the results easier to read and to be consistent with the Beck *et al* (2001) results in Table 4, D- indicates the sign has been changed.

(c) The sign on the long run estimators with the Freedom House data have been changed to make the results correspond to those with the LIEC database. Thus, in the reported results, a positive coefficient means that there is a positive relationship between democracy and economic growth.

(d) The LIEC database is scaled 1=least democratic to 7=most democratic so a positive coefficient means that there is a positive relationship between democracy and economic growth.

(e)  $D \rightarrow Y$  refers to long-run elasticities when GDP is the dependent variable.(f)  $Y \rightarrow D$  refers to long-run elasticities means democracy is the dependent variable.

## NOTES

<sup>1</sup> See Pesaran and Pesaran (1997), Pesaran and Shin (1999) and Pesaran *et al* (2001) for technical details regarding the computation of the  $F$ -statistic and critical values for the significance level.

<sup>2</sup> Formally, dynamic OLS is based on an alternative representation of the system which assumes the following *a priori* normalisation, which can be obtained in any system with cointegrating vectors:  $\Delta X_t^1 = \kappa_t^1$  and  $X_t^2 = \Phi_0 + \Phi X_t^1 + \kappa_t^1$ . Here  $X_t' = \begin{bmatrix} X_t^{1'} & X_t^{2'} \end{bmatrix}$  and the dimensions of  $X_t^1$  and  $X_t^2$  are  $(p-r) \times 1$  and  $(r \times 1)$ , respectively. The error processes are deemed stationary and by incorporating both leads and lags of  $\Delta X_t^1$  and estimating the normalised cointegrating vectors,  $\Phi$ , by OLS, one can obtain an estimator asymptotically equivalent to MLE.

<sup>3</sup> Formally, FMOLS involves estimating:  $y_t = \sigma_0 + \sigma_1' X_t + \mu_t$ ,  $t = 1, 2, \dots, n$ . Here  $y_t$  is an  $I(1)$  variable and  $X_t$  is a  $(k \times 1)$  vector of  $I(1)$  regressors, which are not cointegrated among themselves.  $X_t$  has the following first difference stationary process:  $\Delta X_t = \eta + \lambda_t$ ,  $t = 2, 3, \dots, n$  where  $\eta$  is a  $k \times 1$  vector of drift parameters,  $\lambda_t$  is a  $k \times 1$  vector of  $I(0)$  variables.

<sup>4</sup> To illustrate the difference between short-run and long-run Granger causality assume that there is a long-run equilibrium relationship between democracy and economic growth, democracy causes economic growth and a shock occurs that changes the level of democracy. The shock will effect the dynamic path of economic growth in two ways. First there is a short-run transitory impact that is captured by the beta parameters in equation (3). Second, there is then a further long-run impact through the error correction term operating to restore the long run equilibrium that is captured by the phi parameters in equation (3). This long-run impact is absent in the case when only the short-run causality is present. If we have only short-run causality a change in the level of democracy causes only a short term change in the level of economic growth. However if we have both short-run and long-run causality two impacts operate, the short term impact, and a long term impact as equilibrium between the levels of the variables is restored.

<sup>5</sup> There is no data for the Democratic Republic of Congo in the Beck *et al* (2001) dataset.