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INSTITUTIONAL QUALITY AND ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM THE SUDANESE ECONOMY

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ABSTRACT: *This study aims to explore the extent to which conventional methods used in the majority of relevant growth studies can successfully interpret the economic performance of a highly underdeveloped African country such as Sudan. Applying an ARDL bounds-testing approach to cointegration proposed by Pesaran et al. (2001), we look into the short-run as well as long-run relationships between institutional and various other*

key economic variables and economic growth over the period 1972-2008. The empirical results obtained suggest that, for the Sudanese economy, the quality of the institutional environment is one of the most important factors in defining economic prosperity.

KEY WORDS: *Institutions quality, Economic Performance, Sudan, ARDL Cointegration*

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1. INTRODUCTION

Many studies on the determinants of growth confirm the relevance of the quality and economic development of institutions (see, for example, Tavares and Wacziarg, 2001; Acemoglu et al. 2003; Easterly et al. 2004; Rigobon and Rodrik, 2004). In fact, in the past few years, even though we have witnessed a resurgence of research into the sources and channels through which institutions may affect the economic performance of a country or region, no clear evidence has been established (Pistor, 1995; Eweld, 1995; Weder, 1995, etc.).

In view of this, it seems appropriate to explore the extent to which institutional features and other macro variables are used in conventional growth analysis.

Like many developing countries, Sudan has experienced vast changes in its economic and institutional environment. During the last 20 years Sudan has become an oil-exporting country, which, in conjunction with the implementation of trade liberalization policies, has moved it towards further integration with the rest of the world's economies (Shafaeddin, 2007). Despite these developments, Sudan, like many other underdeveloped countries that sufficiently lack sound economic and political institutions, is vulnerable to shocks and crises that often cause economic and political instability.

In this study, by using Sudan as the focal country in our analysis, we attempt to explore the extent to which the conventional methods used in the majority of relevant growth studies can successfully interpret the economic performance of a highly underdeveloped country. The empirical analysis is carried out by employing the ARDL bounds-testing approach to cointegration proposed by Pesaran et al. (2001), in order to explore the short-run and long-run relationships between institutional and other conditioning economic variables and economic growth for the period 1972-2008.

The remainder of the paper is organized as follows. Section 2 presents the theoretical framework of institutions and economic performance, emphasizing growth studies. Section 3 touches on the empirical methodology and data used, and section 4 elaborates on the results obtained. Finally, section 5 provides some concluding remarks.

2. THEORETICAL BACKGROUND

The ‘institutions’ quality hypothesis’ contends that the institutional framework within which economic agents interact with each other in an economy affects economic development. According to this view, what matters most are the ‘rules of the game’ in a society, which are defined by the prevailing explicit and implicit behavioural norms and their ability to create appropriate incentives for desirable economic behaviour (Rodrik and Subramanian, 2003).

The majority of early studies focused on the relationship between economic development and political institutions (Wittman, 1995; Clague et al. 1999; Scully, 1988; Wu and Davis, 1999). Over the years, however, the development of new measures has led to a number of different institutional issues being addressed in the discussion (Butkiewicz and Yanikkaya, 2006; Vukotic and Bacovic, 2006; Brunt, 2007; Kostevc et al. 2007).

Studies by Dawson (2003), Adkins and Savvides (2002), and Gwartney et al. (1996) showed that institutions that promote economic freedom have a positive effect on economic performance. In addition, a strand of the extant empirical research has scrutinized the extent to which more political freedom leads to less income inequality and to economic prosperity. Studies by Muller (1995), Granato et al. (1996), Li et al. (1998), Barro (1999), Bourguignon and Verdier (2000), Easterly (2001), Gradstein et al. (2001), Sylwester (2002), and Easterly and Levine (2003), among many others, report that countries with greater civil liberties have lower levels of income inequality. In time the debate on institutions moved beyond the measure of economic freedom or civil liberties and onto issues such as corruption, quality of bureaucracy, rule of law, etc., and many studies explored their impact on economic performance (Huntington, 1968; Leff, 1964; Krueger, 1974; De Soto, 1989; Kaufmann and Wei, 1999; Wei, 1999; 2000; Knack and Keefer, 1995; 2002; Svensson, 1998; Barro, 1996; Demirguc-Kunt and Detragiache, 1998).

Currently, the bulk of the research on the determinants of economic performance concentrates on the role of institutions in the discussion and its focus has shifted from macroeconomic variables to the quality of institutions. Empirical evidence from several studies (see, for instance, Osman et al. 2012; Rodrik et al. 2002; Acemoglu et al. 2003; Easterly et al. 2004) even suggests that the positive correlation between good economic policies and development is the result of good institutions, which, once they are introduced into the analysis, make the correlation disappear.

Like most African countries, Sudan has struggled continuously to establish political and economic freedoms since its independence in 1956. Since then the country has experienced numerous military coups and counter coups and has survived disastrous civil wars.¹Sudan's complex armed conflicts² have been characterized as 'interlocking civil wars' whose causes are intertwined with economic, resource-based, ethnic, cultural, religious, and international dimensions. However, all causes are underpinned by the state's crisis of legitimacy, which permits political elites to control its institutions for their own benefit. Ali et al. (2005) show that in Sudanese society there is overwhelming agreement that bad institutions and an unstable political environment are the main causes of its poor development performance.

According to Ali et al. (2005), the highly volatile growth³ record of Sudan is related to the structure of institutions inherited from the colonial period, which is not only weak but has not changed significantly over the years, at the same time dramatically failing to provide a viable solution to the country's major political and economic challenges and to propel growth. Johnson (2003) points out that the civil violence in Sudan has roots in the deep injustices created historically during the two waves of colonization. The old social hierarchy⁴ is still reproduced in contemporary Sudan and significantly contributes to political, economic, and social marginalization of large parts of the population, and to poverty and horizontal inequality. Elbadawi (2005) also states that the Sudanese political establishment's lack of vision following independence further reinforced the inherited colonial legacy. The ensuing political landscape was thus characterized by a high degree of political instability, which produced three short-lived democracies and three long-reigning military regimes.

1 The civil wars between the government and southern armed groups (1955-1972 and 1983-2005) have received the most international attention. However, the Beja in the east, the Fur in Darfur, the Nuba in Kordofan are some among many others that have been involved in armed conflict with the Sudanese government or government-backed militias.

2 See Ali et al.(2005) for a review of the conflict causes and the historical preconditions leading to the civil wars in Sudan.

3 Similarly, Elbadawi (2005) notes that the growth record of Sudan has also been very volatile with two distinctive high periods, the first during the peace era following the Addis Ababa agreement (1975-79) and the second during the current growth spell (1995 to present), which is mostly driven by exceptionally favourable weather conditions and the drilling of oil.

4 Institutions related to imperialism and exploitation created a particular type of social hierarchy in which the Arab and Muslim population dominates other groups, that are marginalized in the peripheral regions.

Sudan is far from being an African country that enjoys democracy; however, it has embarked on several market institutional reforms in an attempt to liberalize its institutional and economic environment. Hence, an assessment of the impact of these institutional reforms and the institutional environment in general on its economic growth becomes imperative.

None of the studies on the Sudanese economy has focused on how institutional reforms have affected economic performance, and the few studies on Sudanese economic growth mostly rely on descriptive empirical techniques. The present study attempts to provide insights into the growth determinants of Sudan during the period 1972-2008 by including institutional quality variables along with other control variables and by employing the ARDL method to cointegration.

3. DATA AND METHODOLOGY

In order to explore the presence of long-run and short-run relations between Sudan's economic performance and institutional and economic environment variables, we apply the ARDL approach to cointegration (see Pesaran et al. 2001). The ARDL approach to cointegration, also known as bounds testing, has certain advantages in comparison to other cointegration methodologies. More specifically, the ARDL is a single-equation method and thus requires the estimation of a fairly small number of parameters: as a consequence, this approach is more efficient, especially with small data samples. The commonly used Johansen Maximum Likelihood method is based on a VAR system of equations that is fairly data intensive and there is a substantial loss of degrees of freedom. It follows, therefore, that most of the hitherto econometric results based on relatively small samples are very likely to be of dubious validity. These limitations do not apply to the ARDL.

In addition, the ARDL method avoids the problem of pre-testing for the order of integration of the individual variables, which is a matter of crucial importance in any empirical analysis. In the case where a long-run relationship between the variables involved is confirmed, an Error Correction (EC) model can be used to test for Granger-type causality. The advantage of using an EC specification to test for causality is that it allows testing for short-run causality through the lagged differenced explanatory variables on the one hand, and for long-run causality through the lagged EC term on the other hand. As Granger et al. (2000) suggest, a significant EC term implies long-run causality running from the explanatory variables towards the dependent variable.

The ARDL approach begins with the estimation of the following unrestricted EC version of the ARDL model for, let us say, two variables, Y and X :

$$DY = \alpha_0 + \sum_{i=1}^p b_i DY_{t-i} + \sum_{i=0}^p c_i DX_{t-i} + \delta_1 Y_{t-1} + \delta_2 X_{t-1} + e_i \quad (1)$$

$$DX = \alpha_0 + \sum_{i=1}^p b_i DX_{t-i} + \sum_{i=0}^p c_i DY_{t-i} + \delta_1 X_{t-1} + \delta_2 Y_{t-1} + e_i \quad (2)$$

On the basis of equations (1) and (2) we engage in bounds testing in order to ascertain the presence of a long-run relationship between the variables. The F -test is applied for the joint null hypothesis that the coefficients on the level variables are jointly equal to zero (Pesaran and Shin, 1999; Pesaran et al. 2001). The testing statistic displays a non-standard F distribution which depends on whether the variables are individually $I(0)$ or $I(1)$, the number of regressors, and the existence of an intercept and/or a trend. Instead of the conventional critical values, Pesaran et al. (2001) report two sets of critical bound values for all classifications of the repressors, which are purely $I(1)$, purely $I(0)$, or mutually cointegrated. If the test statistic exceeds the respective upper critical value, it may be argued that there is evidence of a long-run equilibrium relationship. If the test statistic falls below the lower critical value, we cannot reject the null hypothesis of no cointegration. Finally, if the test statistic lies between the two bounds, then the test becomes inconclusive.

The conditional long-run models can be produced from the reduced-form solution of equations (1) and (2), when the first-differenced variables are set jointly to equal zero. The long-run coefficients of the EC models are estimated through the ARDL approach to cointegration and the use of OLS. The corresponding EC specification is based on the implied ARDL specification, through a simple linear transformation (Banerjee et al. 1993). The lag structure for the ARDL specification to account for the short-run dynamics is determined by Akaike's Information Criterion (AIC), which also controls for the problem of autocorrelation. In our analysis we employ a simple linear growth model of the following form:

$$Y_t = \alpha + \beta D_t + \psi P_t + \omega Z_t + \mu_t \quad (3)$$

where the subscript t is the time dimension ($t=1...T$); Y_t is the growth rate of GDP per capita income; D_t is a vector of institutional variables; P_t is a vector of variables that approximates macroeconomic environment (i.e., inflation rate, government size, trade openness, etc.); Z_t is a vector of control economic explanatory variables

(i.e., population growth, investment share, FDI, etc.) that in many growth studies have shown a robust link to economic growth, and μ_t is the error term.

The dependent variable (Y) in our analysis is the average growth rate of real GDP per capita income.⁵ The first explanatory variable in equation (3) refers to institutional quality measures. Unfortunately, there is only one source that provides respective information for such a long period for Sudan and this is Freedom House. Freedom House has been watching political freedom around the world and monitors political freedom in each country on an annual basis using two criteria, political rights and civil liberties. Political rights refer to the freedom to participate in the political process⁶, whereas civil liberties are rights to free expression, to organize or demonstrate, and to freedom of religion, education, travel, and other individual rights.⁷ We employ the combined rankings applicable to Sudan over the years 1972-2008. In order to employ the ordinal combined rankings, we transform them into a set of dummy variables which takes the value of 2 for the classification free, 1 for partly free, and 0 for not free. In the case of Sudan, the dummy index ranges between 0 and 1.⁸

Following the respective growth literature, we introduce a number of macroeconomic policy measures (vector P). The first policy variable employed in the analysis is inflation (INF) as an indicator of macroeconomic instability, which is proxied by the growth rate of CPI (Consumer Price Index). It is expected that high inflation will distort economic activity and reduce economic growth (Fischer, 1993). The second policy variable is government size (GOV), measured as a percentage of government spending to GDP, which is used in an attempt to capture the stimulating effect of expansionary government policy (Barro, 1991). Given the existing theoretical approaches (Keynesian and mainstream), an ambiguous relationship is possible. Finally, the third policy variable employed in the empirical analysis is the degree of the economy's openness (OPN), measured by the sum of exports and imports as a percentage of nominal GDP. According to Feder (1982), Romer (1989), and Levine et al. (2000), a country's open trade

5 Data on the variables used in our empirical analysis come from *World Development Indicators* (WDI) published on line by the World Bank.

6 In a democracy, this means the right of all adults to vote and compete for public office and for elected representatives to have a decisive vote on public policies.

7 Freedom House derives the annual status of political freedom for each country, with 1.0 and 2.5 classified as "free", between 3.0 and 5.5 classified as "partly free", and between 5.5 and 7.0 as "not free".

8 Out of the 37 years in our sample, Sudan is characterized as "partly free" for only 9 years and in the remaining years is characterized as "not free".

policies may increase profitability and by extension the incentive to invest, which in turn may promote growth in a country.

An additional set of explanatory variable soften used in this type of research, (Z_i), describe the credit conditions, population growth, etc. of the country. Among these variables we include domestic investment measured as a share of gross fixed capital formation to GDP, since in the growth literature it is considered an important factor propelling growth performance. An additional factor included in the pool of control variables attempts to capture the domestic financial environment (*PSC*) and is measured as the share of domestic credit provided by the banking sector to GDP. A variable of population growth (*POP*) is also introduced in our empirical work in order to capture its effect on economic performance. The existing literature suggests that the impact of *POP* on growth is expected to be of a negative nature; however a few studies have indicated that high growth in population may positively affect growth by supplying cheap labor and human capital (see Baumol et al. 1989).

Table 1 contains the variables used in our model specifications and their expected signs from the traditional growth theory.

Table 1: Variables and Expected Signs

Variables	Definition of Variables	Expected signs
Dependent variable <i>Y</i>	Growth rate of real per capita GDP	
Independent Variables		
<i>Institutional Quality</i> <i>PF</i> <i>DUM</i>	Political Freedom Index	-
<i>Policy Variables</i>		
<i>INF</i>	Inflation	-
<i>GOV</i>	Government Spending (% GDP)	- or +
<i>OPN</i>	Trade openness (% GDP)	+
<i>Control Variables</i>		
<i>POP</i>	Population Growth	+ or -
<i>INV</i>	Domestic Investment (% GDP)	+
<i>PSC</i>	Domestic credit (% GDP).	+

4. EMERGING EVIDENCE

The standard procedure requires testing the involved series for stationarity. Although the ARDL methodology does not require pre-testing for a unit root, in the case of $I(2)$ variables the computed F-statistic for the existence of a cointegration relationship is not valid (Peasaran et al., 2001). Thus, we applied conventional ADF tests for all variables and we found no evidence of $I(2)$ series. In the next step of the ARDL analysis we test for the existence of a long-run causal relationship between the growth performance and the group of explanatory variables used in our research for Sudan.

Table 2: Results from bounds tests.

<i>F(Y/ INF, GOV, OPN, INV, POP, PSC, PFDUM)</i>					
AIC Lags	F-statistic	Inpt	trend	Bounds testing (at 99%)	Outcome
3	F (3, 26) =7.45 [0.01]	yes	yes	lower: 3.220 upper: 4.411	Cointegration

Notes: Asymptotic critical value bounds are obtained from Table F in appendix C, Case III: intercept and trend for $k = 8$ in Peasaran and Peasaran (1997, p.478)

As suggested by the bounds testing procedure in Table 2, the results are in favour of the existence of a cointegrating relationship. In addition, the analysis which follows regarding the estimation of the implied ECM models reveals the validity of long-run cointegration relationships.

Table 3: ARDL-VECM model diagnostic tests.

Model	$R^2 = 0.69$	F-Stat. F (16, 18) = 5.63 [0.00]
ARDL	Serial Correlation $\chi^2(1) = 1.312 [0.252]$	Normality $\chi^2(2) = 1.601 [0.449]$
(1,2,0,2,1)	Functional Form $\chi^2(1) = 0.789 [0.374]$	Heteroscedasticity $\chi^2(1) = 0.182 [0.670]$

Notes: The ARDL equations are selected based on AIC.

Table 3 suggests that the estimated regression fits very well and passes all the tests regarding serial correlation, heteroscedasticity, and non-normality. In some cases the functional form test reveals misspecification, which is to be expected since according to Shrestha and Chowdhury (2005) it is natural to detect misspecification problems because ARDL equations are probably of a mixed order of integration, i.e., $I(0)$ and $I(1)$.

Table 4 below reports the long-run estimates of the properly selected ARDL specifications for our model having standardized the cointegration vector with respect to growth performance.

Table 4: Estimated long-run coefficients using the ARDL Approaches

ARDL (2,0,2,0,0,2,2,0) selected based on AIC. Dependent variable is Y_t

Regressor	Coefficient	t-statistic	P-Value
<i>INV</i>	0.52387	2.045**	[0.050]
<i>GOV</i>	-0.17368	-0.840	[0.547]
<i>INF</i>	-0.11231	-0.127	[0.632]
<i>OPN</i>	-0.29459	-3.739***	[0.001]
<i>POP</i>	1.37823	3.335***	[0.004]
<i>PSC</i>	0.28491	0.537	[0.446]
<i>PFDUM</i>	-8.9694	-5.145***	[0.001]
<i>C</i>	-22.2335	-5.302**	[0.022]
<i>t</i>	0.10278	2.678*	[0.035]
R²	0.8334		
F (16, 18)	5.6270		

Note: *** significant at 1% level, ** significant at 5% level, * Significant at 10% level.

The results of the estimated coefficients of the long-run relationship reported in Table 4 reveal that the institution quality index (*PFDUM*) has a significant impact on economic growth in Sudan during the period under investigation. In Sudan the right to participate in the political process, the right to free expression, to organize or demonstrate, and other individual rights are almost absent. As such, the two components of political freedom, i.e., civil liberties and political rights, record high scores that reflect the weak quality of institutional environment in Sudan. This outcome confirms the proposed link between the quality of a country's institutions and their level of economic development (Keefer and Knack, 1997; Hall and Jones, 1999; Chong and Calderon, 2000; Glaeser et al., 2004) and supports the idea in growth literature that institutions define the 'rules of the game' and the conditions under which economic agents operate in an economy (Butkiewicz and Yanikkaya, 2006; Vukotic and Bacovic, 2006; Brunt, 2007; Kostevc et al. 2007).

With respect to policy variables included in the present analysis, the results confirm the argument posed by Acemoglu et al. (2003), according to which macroeconomic variables (i.e., inflation, government spending, exchange

rates, etc.) have no predictive power in growth models once institution quality indexes are included in the analysis. Easterly et al. (2004) have also arrived at the conclusion that macroeconomic policies do not affect economic performance after accounting for institutions; similarly, Rodrik et al. (2002) show that once institutions are introduced in the analysis, macroeconomic variables such as trade have no direct effect on income. Turning now to the results reported in Table 4 for the policy variable, we observe that although the coefficient of *INF* retains the negative sign suggested by economic theory, it is found not significant. This result may be attributed to the large structural fiscal deficit and erratic monetary and exchange rate policies that weaken the financial system in many Sub-Saharan African countries, including Sudan.

The coefficient of *GOV* is also found to be negative and not significant. The negative sign indicates that an increase in government size has a detrimental impact on Sudan's economic growth and harms its economic capacity. This outcome is in accordance with the results obtained by Ghura (1995) and Nelson and Singh (1994).⁹ With respect to *OPN*, the results in Table 4 confirm a negative and statistically significant relation with the *Y*, indicating that policies designed to promote trade openness may not have the expected positive impact, since in Sudan imports dominate exports and there is a chronic trade deficit. It is worth noting at this point that Rodrik et al. (2002) showed that once institutions are introduced into the analysis, trade variables exert no direct effect on growth performance.

Continuing the discussion of the results reported in Table 4, we might argue that *INV* exert a positive and significant effect on Sudan's economic growth. The small and the statistically weak effect of investment on growth may be attributed to prevailing political instability and prolonged civil wars which hamper the growth effects of the undertaken investment projects. An interesting result that our analysis shows is that *PSC* is positive but not significant, which implies that a rise in private credit will not boost private investment and extend growth, as economic theory suggests. These weak findings for the Sudanese economy may be attributed to banks' inefficient allocation of resources, the absence of appropriate investment attitudes, and the poor quality of credit disbursal. This outcome is in accordance with other studies for developing countries that indicate that the impact of financial sector on growth is either negligible (e.g.,

⁹ More specifically, Ghura (1995) found a negative relation when testing the relation between government consumption and economic performance in developing countries, whereas Nelson and Singh (1994) found no relation between the two variables.

Anoruo and Ahmad, 2001) or not positive (Reinhart and Tokatlidis, 2003). Finally, the population variable exerts a positive and statistically significant effect that promotes economic growth.¹⁰

Table 5 reports the findings from the EC models corresponding to the adopted ARDL specifications for equation (3).

Table 5: Error correction representation for the selected ARDL model

ARDL (2,0,2,0,0,2,2,0) selected based on AIC. Dependent variable is ΔY_t

Regressor	Coefficient	T-Ratio	P-Value
ΔINV	0.61477	1.9790*	[0.061]
ΔGOV	-0.25746	-0.76071	[0.455]
ΔINF	-0.00671	-0.22646	[0.823]
ΔOPN	-0.40789	-3.8223***	[0.001]
ΔPOP	4.84843	3.22261***	[0.004]
ΔPSC	0.33921	0.46693	[0.645]
$\Delta PFDUM$	-10.6984	-4.0769***	[0.001]
ΔC	-41.5735	-2.6045**	[0.017]
ΔT	0.30278	1.9614*	[0.063]
<i>ECM (-1)</i>	-0.15260	-8.3944***	[0.000]
R ² 0.8733			
F (13,21) 9.5439			
DW 2.2056			

Notes: (***)significant at 1% level, ** significant at 5% level, * significant at 10% level. The figures for EC term represent *t*- values, whereas the rest are the *p*-values of Wald χ^2 tests for short run causality effects; Δ is the difference operator.

The EC term in our model is found significant, confirming the existence of a long-run equilibrium relation in Sudan with long-run causality running from the group of the core explanatory variables towards the growth rate. Its sign impliesthe presence of a fairly high speed of adjustment to equilibrium after a shock and approximately 15% of the disequilibria in real GDP per capita growth of the previous year’s shock adjusts back to the long-run equilibrium in the current year.

¹⁰ The time trend variable shows a positive and statistically significant relationship that reflects an upward trend in real GDP per capita, much of which could be attributed to the success of the structural adjustment programme and the export of oil.

The Wald (χ^2) tests for the lagged first-differenced explanatory variables included in the estimated EC specification provide evidence in favour of a significant short-run causal effect running from *INV*, *OPN*, *POP*, and *PFDUM* towards the growth rate of GDP per capita. However, there is no such evidence for the *GOV*, *INF*, and *PSC* variables as reflected by the respective Wald tests.

The stability of the long-run coefficients is checked by using the Cumulative Sum (CUSUM) and the Cumulative Sum of Squares (CUSUMSQ). According to this procedure, the CUSUM and CUSUMSQ statistics are updated recursively and plotted against the break points. If the plots of CUSUM and CUSUMSQ statistics stay within the critical bounds of 5% level of significance, the null hypothesis that all coefficients in the given regression are stable cannot be rejected. As can be seen in Figures 1 and 2, the estimated CUSUM and CUSUMSQ statistics stay within the critical bounds, indicating that all coefficients in the employed ARDL error correction model are stable.

Figure 1: Plot of Cumulative Sum of Recursive Residuals

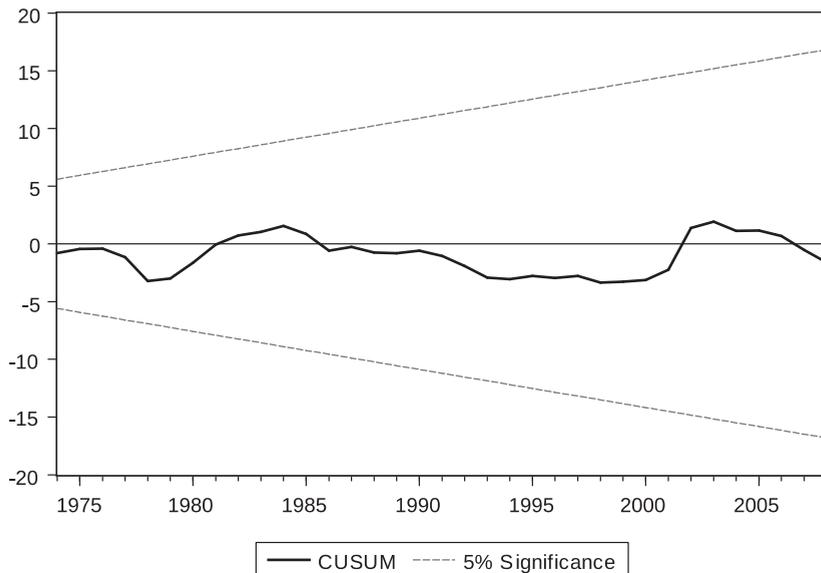
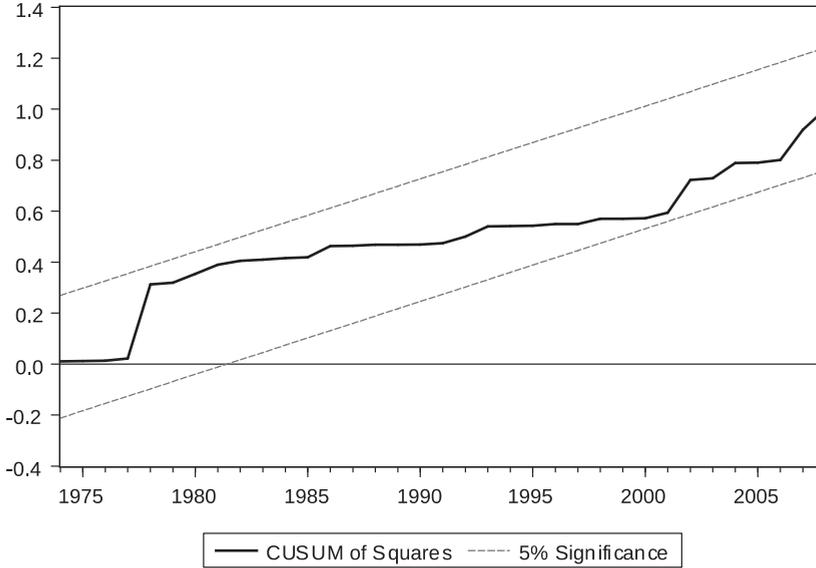


Figure 2: Plot Cumulative Sum of Squares of Recursive Residuals



5. CONCLUDING REMARKS AND POLICY IMPLICATIONS

The present work evaluates the impact of institution quality on real GDP per capita over the period 1972-2008. The short-run and long-run relationships between institutional quality and other conditioning economic variables with economic growth are explored by using the Autoregressive Distributed Lag approach to cointegration. The empirical results of the study indicate that the institutional quality environment is one of the most important factors in defining the Sudanese economy's economic prosperity. The political freedom index is found to exert a negative and statistically significant effect on the economic performance of Sudan, indicating that the absence of political freedoms is detrimental to its society in general. Taking into consideration that improvement in institutions is a long-term project and that over the fifty-four years of independence the country has been unable to drastically change its weak institutions inherited from the colonial period, it becomes imperative that policymakers should focus their efforts on improving the quality of the country's institutions in order to propel economic prosperity in Sudan. Hence, from a policy perspective the result of our

analysis can be taken as a first move toward a roadmap for institutional reform, which might prove to be of great importance in promoting economic growth.

Also, the empirical evidence showed that the estimated coefficient of the trade openness variable does not display the expected (from conventional trade theory) relation; it is negative and statistically significant, indicating that policies designed to promote trade liberalization policies may not have the expected positive impact on the Sudanese economy, in which imports dominate exports and there is a chronic trade deficit. Hence, some measures of protectionism might prove to be fruitful in the case of the Sudanese economy.

The positive and statistically significant long-run relationship between population increase and Sudan's economic growth is interesting. This result in a way contradicts the general belief that large population works to the detriment of economic prosperity in a poor country: burgeoning population may provide cheap labour and future human capital, which are both basic elements that propel growth. Hence in Sudan the implementation of future development policies should take into consideration that a large population may prove a very useful tool for designing appropriate economic policies.

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