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The role of institutions in promoting economic growth and development has generated considerable interest among researchers and practitioners in recent years. This paper explores the role of state institutions in promoting growth using a GMM econometric model. Specifically it attempted to test impact of two dimensions of institutions on growth using recently developed index of institutionalized social technologies and its sub indices namely Risk reducing technologies and Anti rent seeking technologies. The result suggests a strong causal link between institutional quality and economic performance, and also confirms conditional convergence as predicted in the modern theories of growth

Introduction

Exploring the relationship between economic performance and the quality of domestic institutions has been a major area of interest. The better quality of institutions has a positive and significant effect on growth and human development and this effect is more vehement for long term growth than short term. The role of regulatory institutional capacity also play important role for the cross-country variations in economic growth through positive impact on total factor productivity. The causality between institutions and economic performance is also important issue and studies shows better institutions leads to a higher income rather than causation being in the opposite direction. Some studies find that the quality of governance and institutions is important in explaining the higher rates of investment through improving the climate for capital creation .Other studies reiterated institutional roles in improving international capital flows in particular FDI and portfolio investment.

There is a rich literature on Solow growth model, extended growth model, endogenous growth model and extended endogenous growth model. This literature assumes transmission mechanism, distributive policies and institutions, are working properly and income is converging to high level. However, in developing countries this assumption is not valid and one of the most important reasons for low productivity and skewed income distribution.

The present study makes an early attempt to test empirically the role of institution on economic development. Earlier studies use data bases and indices which cover one or few aspects of the institutional capacity. For this paper we develop a comprehensive index of "institutionalized social technologies" which is build on theoretical framework of contract and predatory theories set by North (1981). This index is made up of Risk reducing technologies based on contract theory and Anti-Rent seeking technologies based on predatory theory of state.

The paper is organised is follow. Section gives introduction, section 2 review the literature, section 3 discusses the empirical side of the paper and section 4 concludes the paper.

Review of literature

North (1990) defines institutions as the rules of the game in a society or, more formally, "the humanly devised constraints that shape human interaction". These rules of game can be in form of formal institutions like laws and regulations or informal ones which assimilated to culture Tabellini (2005) or social capital Putnam & at al. (1993). Some institutions lowers transaction cost thereby result in innovation and productivity whereas other institutional features impedes information flow, raising information costs and eroding the gains from information, and limit entrepreneurial activity. Examples of institutions that stunt economic growth include government, police and/or court corruption, excessive taxation and/or regulation, unstable and/or inconsistent monetary and fiscal policy. (Frye and Shleifer 1997; Johnson, Kaufmann, Zoido-Lobaton 1998; Shleifer and Vishney 1993, 1994; Soto 1989, 2000; Rodrik at al. 2003, 2004; Easterly and Levine 2002; Kaufmann and Kraay 2002; Kaufmann, Kraay and Mastruzzi 2005; Knack and Keefer 1995; Mauro 1995; Meon and Sekkat 2004; Barro 1997,2000; Sachs and Warner 1995). On distinguishing between kinds of institutions, North (1981) proposes two theories, a "contract theory" of the state and a

"predatory theory" of the state. According to the first theory, the state and associated institutions provide the legal framework that enables private contracts to facilitate economic transactions hence reducing transaction costs. According to the second, the state is an instrument for transferring resources from one group to another.

Neoclassical growth modelling Solow (1956) predicted economies move toward their steady-state growth path which means that in the long run, income per capita levels will converge. However, lack of empirical support for convergence has presented a major challenge to these models. A more refined endogenous growth theory by Romer (1986) and Lucas (1988) and its empirics provides the evidence of 'conditional'' convergence, where convergence is conditional on factors some of which are related to institutions. This is explained by new growth theories as "knowledge spillovers" assumption whereby any sector in less advanced countries can catch-up with the current technological frontier whenever it "innovates". The term "innovation" also refers to the adaptation of technologies which in turn depends upon the institutional arrangements. As argued by North and Thomas (1973), that far from being exogenous, technological changes crucially depend just on the prevailing institutions through their impact on incentives and transaction costs: it is these that largely determine how fast, if at all, technological changes will actually progress.

Institutions contributes to growth and development by reducing risk of doing business thus preventing diversion of resources and by preventing predatory rent seeking activities thereby diverting resource towards innovation. A society free of diversion, productive units are rewarded by the full amount of their production and individual units do not need to invest resources in avoiding diversion.

In particular (Acemoglu et al. 2001, 2002, 2005) show that quality of institutions have a more important effect on long term growth than on short term one. Jalilian et al. (2007) emphasises the role of regulatory institutional capacity in accounting for cross-country variations in economic growth Méon and Weill (2006) , Olson et al. (1998) find evidence suggesting that

institutional factors are strongly related to total factor productivity. As productivity growth is higher in countries with better institutions and quality of governance.

With regards to causal effect between institutions and economic performance , studies like Acemoglu, Johnson, and Robinson 2000; Olson et al. 1998; Rodrik et al. 2004; Kauffman et al. 2005, p. 38), indicates indicate that a better institutions leads to a higher income rather than causation being in the opposite direction. In particular Kauffman suggests that a one standard deviation improvement in governance institutions leads to a two to threefold difference in income levels in the long run.

Some studies find that the quality of governance and institutions is important in explaining the rates of investment, as they suggested they effect economic performance through improving the climate for capital creation (Kirkpatrick, Parker, & Zhang 2006; World Bank, 2003). Other studies reiterated institutional roles in improving international capital flows in particular FDI (Reisen and De Soto 2001; Smarzynska and Wei 2000). And portfolio investment Gelos and Wei (2002)

Empirical Analysis

The aim of the empirical section of the paper is to investigate links between nations' institutional quality and economic growth, using GMM instrumental variable estimation method in order to control for endogeneity. This subsection describes data, the regression specifications and methodology.

Data Description

The dependent variable is the GDP growth in real term. There are two sets of independent variables. First is the institution al variables and send is control variables. For the institutional variables we have used recently developed indices by Siddiqui and Ahmed (Unpublished) for

the measure of institutional quality. The index named 'index of institutionalized social technology', covers 141 countries. This comprehensive index covers wide range of institutional performance indicators and employ more than 120 data sources, namely (World Economic Forum; Global integrity; Kaufmann at al. 2008; PRS; BERI; Gwartney and Lawson 2008; Miller and Holmes 2009; Cingranelli and Rishards; Djankov at al. 2001; La Porta at al. 1999; Lambsdorff; Bertelsmann; Marshall and Keith; Kurtzman and Yago 2009). We take index of institutionalized social technology, as well as its sub indices of Risk reducing technologies and Anti-rent seeking technologies for measurement of institutional quality. This index and its sub indices are build on theoretical framework of contract and predatory theories set by North. Specifically sub index of Risk reducing technologies is based on contract theory whereas index of Anti-Rent seeking technologies is based on predatory theory of state.

Risk reducing technology removes information asymmetry, creates mutual trust and hence decreases the risk of creating long term business relationships. It re-price contravention activities through increasing risk of getting caught. This Index is aggregate form of following risk reducing Technologies. 1. Contract enforcement and property rights focusing on financial and investment rights and contract enforcement. 2. Justice system measuring judicial professionalism, independence, efficiency and impartiality and affordability. 3. Law enforcement covering focusing on risks pertaining to theft losses, tax evasion, confiscation organized crime as well as reliability and professionalism of police and other law enforcement services, business costs of crime and violence and torture, extrajudicial killing, political imprisonment, and disappearance indicators and finally the Policy stability that focus on executive constraints, military interference in rule of law and the political process and stability of democratic institutions.

Anti-Rent seeking technologies plugs in predatory opportunities that arise due to gaps or loopholes in ineffective or week institutions, creating rents for controlling agents betting

them higher return than though innovation hence is making society moves from innovative to rent seeking activities. This index specially focuses on technologies which helps curb the rent seeking opportunity arising from institutions, policies and political system. It includes following technologies 1. Technologies curbing institutional Rents include regulatory and bureaucratic efficiencies, ease in doing business and control of corruption. 2.Policy rents curbing technologies includes competition and market excess, Freedom of businesses from Licences, permits and restriction and Price controls, and less numbers of businesses operating under shadow economy. And 3. Political Rent curbing technologies measures the extent of power given by institutions to political authorities. Specifically, it focuses on political Accountability, participation and competitiveness, citizen Rights and Voice. These indices are in 0 to 1 ranges where higher values indicating better institutional quality. Dependent and control variables such as Real GDP Growth, Gross domestic savings as % of GDP, Debt as % of GNI and Inflation are taken from World Development Indicators and Global Development Finance, World Bank. Public investments as % of GDP is taken from Guy et al. (1999). All these variables are expressed in term of averages from 1988 to 2003. Real GDP Per Capita in 1960 is taken from Levine and Renelt (1992), while Human development Index in taken from UNDP. Table 1 gives detailed information about the variables and their data source.

Despite majority of variables in our index measuring institutions belongs to roughly the same time as other control and dependent variable, some might belong to different times. Even then its validity can be established as institutional variables rarely change over the years. As Kaufmann at al. (2008)**,** indicates these changes are relatively small, and depict considerably high correlation between current and lagged estimates. Even if some variable significantly change over time, its effect in aggregate index would not be much and would not produce any significant effect in our analysis.

Regression Specification

Our specification is based on combining growth theories such as Solow (1956), Romer (1986) and Lucas (1988) with North (1981). Specifically Modern growth theories and their empirics provide the evidence of conditional convergence, where convergence is conditional on factors some of which are related to institutions. And the role of these institutions in economic growth is explained by north in "contract theory" and a "predatory theory" of the state. To assess these roles we used standard growth regression framework which mostly follow growth empirics literature, such as (Barro 1991; Mankiw et al. 1992; and Leving and Renelt 1991).

$$\Delta y_i = \beta_0 + \beta_1 I_i + \beta_2 X_i + \epsilon_i$$

where i is the country ϵ_i is the error term. The economic growth Δy_i is measured by change as the GDP in real terms, I_i stands for institutional variables, whereas X_i is the vector of control variables for other determinants of growth.

Other determinants of growth denoted by X_i include variables to control for other factors that influence growth. In most empirical studies, the choices of additional control variables are ad hoc across studies. As one example, the data appendix in Levine and Renelt (1992) lists over 50 possibilities. In our study, we will be using variables pertaining t, initial conditions, macroeconomic stability, human capital, physical capital, savings, Debt and current account balance.

The first control variable describe initial conditions, In new classical growth models, such as Solow (1956), a country's per capita growth rate tends to be inversely related to initial income, which shows poor countries tend to grow faster than rich countries. Thus they tend to converge across countries. But studies like Barro and Sala-i-Martin (1992) proved this conversion is conditional upon other economic variables, such as measures of democracy,

political stability, industry and agriculture shares in countries, rates of investment. To find the evidence of convergence, we used Real GDP per capita in 1960.

Another Factor producing considerable influence on growth is human capital. It fastens the process innovation of new goods and technologies, ultimately driving growth and productivity, hence it could be positively related to growth. This conclusion is also supported by Barro (1991, p.22). In growth empirics education attainment is widely used as a proxy of human capital. But in our study secondary school enrolment as a proxy of education attainment is highly insignificant. Therefore we dropped this from our model. Also studies such as Pritchett (1996) shows improvement in education attainment has no positive effect on growth hence could not be a good proxy for human capital. Perhaps a better measure is to combine education attainment along with other variables like health to capture the effect of human capital collected for the period of 1990 to 2006.

Macroeconomic stability factor in growth empirics is normally captured by consumer price inflation. It is expected that higher inflation tends to reduce growth due to a high level of price instability hence could have a negative expected sign. As Kormendi and Meguire (1985) and Grier and Tullock (1989) find that inflation are negatively related to growth.

To avoid the multicollenarity issue between the saving and investment we have used only public investment rather than total investment. Infrastructure investment is good proxy to use for public capital stocks. It is believed that public capital stock, especially public infrastructure, is an important determinant of the level of investment, in turn, economic growth given that public and private capital stocks are complements. As proved in endogenous growth models, such as (Rebelo 1990; and Barro 1990), per capita growth and investment ratio tend to move together. This variable is captures by public investments as % of GDP as supposed to have a positive sign.

Saving represented by gross domestic saving as % of GDP, is considered a crucial variable of growth equation. With positive expected sign, higher saving leads to higher investment which

in turn leads to higher economic growth. The presumption is that higher saving precedes economic growth. In a typical model of economic growth such as the Solow (1956) model, a clear connection is made between saving and economic growth. Romer (1987,1989) suggests that saving has too large an influence on growth and take this to be evidence for positive externalities from capital accumulation. On the empirical fount, (Modigliani 1970, 1990; Maddison 1992; and Carroll and Weil 1994) prove robust positive correlation between saving and growth.

Another factor producing considerable impact on economic growth is level of public debt. In the traditional neoclassical models, the relation between debt and growth is positive, but this link is flawed by the unrealistic assumption of perfect capital mobility. In real term the effect of debt on economic growth is negative. This could be due to the so-called "crowding out" of public investment, which states that a larger debt service discourages public investment, since it soaks up resources from the government budget and reduces the amount of money available for productive investment. Perhaps a large portion of debt consists of external debt. Its effect on growth is analysed by studies like (Krugman 1988; and Sachs 1989). They proved the hypothesis of Debt overhang meaning that for large debt, the expected interest payments are a positive function of output. Thus, investments decrease, because their return will be taxed away by foreign creditors, and the pace of economic growth will slow down. Its empirical evidence is shown by Pattillo et al. (2002, 2004) show that a large external debt reduces economic growth. We used Percent Value of Debt as % of GDP as indicator of public debt with negative expected sign in growth equation.

Lastly to measure the country dependence on international resources and foreign savings, we use measure of current account balance as % of GDP. The expected sign is ambiguous as in some cases negative current balance the economy is net borrower and may have positive impact on growth at least in the short run.

Among notable variables not captured in our growth model is fiscal policy indicator, which proved to be statistically insignificant and have not being included in our regression specification. All variables have the average value computed from the available data. Most of the variables the data is available for eight years so we have average of eight observation.

Estimation Methodology

We will be using GMM procedure in our analysis as there might be the problem of endogenity that could arise in independent variables specifically in institutional variables, as these variables have a strong positive correlation with growth. In literature, depending on the context, GMM has been applied to time series, cross-sectional, and panel data. Inevitably, GMM builds from earlier work, and its most obvious statistical antecedents are method of moments (Pearson, 1893, 1895) and instrumental variables estimation (Reiersol 1941; Sargan 1958; Hansen 1982). The starting point of GMM estimation is a theoretical relation that the parameters should satisfy that is to choose the parameter estimates so that the theoretical relation is satisfied as "closely" as possible. The GMM is a robust estimator in that, unlike maximum likelihood estimation, it does not require information of the exact distribution of the disturbances. In fact, many common estimators in econometrics can be considered as special cases of GMM. The theoretical relation that the parameters should satisfy are usually *orthogonality conditions* between some (possibly nonlinear) function of the parameters $f(\theta)$ and a set of instrumental variables z_t:

$E\,(f(\theta)'Z) = 0$

Where θ are the parameters to be estimated. The GMM estimator selects parameter estimates so that the sample correlations between the instruments and the function f are as close to zero as possible, as defined by the criterion function:

$J(\theta) = (m(\theta))'\, Am(\theta)$

Where $m(\theta) = f(\theta)'Z$ and A is a weighting matrix. Any symmetric positive definite matrix A will yield a consistent estimate of q. However, it can be shown that a necessary (but not sufficient) condition to obtain an (asymptotically) efficient estimate is to set A equal to the inverse of the covariance matrix of the sample moments m.

To apply this methodology, the following equation is estimated by GMM:

$$\Delta y_i = \beta_0 + \beta_1 I_i + \beta_2 X_i + \epsilon_i$$

The instrumental variables for the equation are all explanatory variables.

Estimation Results

Before looking at estimation results, a cursory look Table 3 provides the correlation coefficient matrix for the key variables used in the study. For comparison, we carry out Spearmen's Rank Correlation focussing on ordinal information as well as Pearson correlation focussing on the interval between observations. The simple correlation coefficients between the dependent variable, GDP growth represented by GDPG8803, and possible explanatory variables as shown in table 3 have the expected signs. The correlation coefficients between the indicators of institutional performance and GDP per capita growth have the expected positive sign. Inflation sign is negative as expected showing macroeconomic instability hampers growth. The signs of savings and debt are also as expected. Showing savings having positive relationship whereas Debt having negative relationship with growth. HDI and investments also depicted positive signs as expected. Showing investments particularly investments in human capital will positively impact growth. Negative sign of correlation between initial GDP and growth shows possible sign of catching up of less developed countries to the ranks of advanced countries. Whereas positive sign with current account balance possibly shows newly growing economies have excess domestic resources and surplus funds. The bivariate correlations between inflation and the institutional proxies used

are negative, supporting the proposition that economies with better institutions are also better able to design macroeconomic policies that stabilize the economy and control inflation. Institutions have high positive correlations with initial GDP, whereas correlation coefficient of initial GDP with other variables showing developed countries generally have higher savings and lower public debt, lower HDI growth and higher current account balance. The correlations shows countries with better institutions normally have higher savings, lower debt and surplus in current account balance. Interestingly correlation coefficients among institutional variables are about 0.97 which is extremely high which shows different institutional measures have high common factors on which these measures are dependent. From regression perspective this also suggests that, included in the same regression might create problem of multicolinearity. Correlation coefficients of inflation is positive with saving and negative with debt showing higher government debt levels compromises monetary policy objectives thereby resulting in inflation, whereas higher savings lowers debt and lowers inflation. Other correlation shows countries with current account surplus would have higher savings, and lower public debt showing surplus funds in economies.

In our estimation procedure, we employ GMM methodology. The estimation results clearly indicate a robust positive impact of institutional variables on growth. In model 1, all variable have expected signs and are highly significant. Specifically initial GDP showing expected negative sign and significant. This clearly indicates the sign of convergence as proposed in growth theories. Negative sign shows countries with lower initial GDP have experience higher growth rate and possibility of catching up. In a simulation to investigate the chances of unconditional convergence we tested by omitting institutional variable from the equation. The result of the equation shows no indication of unconditional convergence as sign for initial GDP per capita was negative however but insignificant. This shows institutions performance is a possible pre-condition for convergence. Moreover, overall significance of other independent variables also improved as institutional variable is introduced in model. Among

other variables, inflation measure having expected negative sign and highly significant at 1% in all models suggests that unstable macro economic conditions have a negative effect on economic growth. Hence pursuing policies of inflation financed growth might not be fruitful in long run. Coefficient of savings also remains positive and highly significant at 1% throughout, clearly showing saving is instrumental to growth as it increase capital accumulation and investments.

Public investment coefficient also showing significant positive sign showing infrastructure investments provide positive externalities thereby increasing productivity and growth. Another form of investment which could provide a positive significant long run effect on growth is investing in human capital more specifically in education and health. We used HDI change as proxy for human capital and found to be statistically significant and positive. This indicates investing in human capital would produce a positive impact on growth, as it increase workers quality and ultimately increase productivity. With regards to other variables the debt variable came out to be negative and highly significant at 1% which shows increase in debt will lead to higher debt servicing ex post, hence crowding out public investment. Debt servicing could also aggravate inflation and debt situation and both hampering growth. The coefficient of current account balance proved to be negative and significant. This might suggests countries with higher current account deficits, might enjoy higher growth. This negative coefficient could be because current account deficit mean the countries are net borrower and their domestic savings are complemented by foreign savings. This could also mean investment opportunities in country could be more than what domestic resources could finance, thus relying and enjoying foreign capital. The institutional variables' coefficients are highly significant and positive indicate institutional quality positively and significantly influence growth. In a simulation we included all three indices in one equation. It was witnessed, when used individually, they became highly significant, but when used with other institutional variables, there significant considerably decreased perhaps because of high

multicollinearity among these variables. Due to this fact, we used them separately in three equations. The three indices separately tested for institutional quality are a composite index of institutionalized social technology and two of its sub indices namely index of risk reducing technologies and rent seeking technologies. All three are positive and highly significant at 1% level; among them rent seeking index causes comparatively larger impact on growth than the risk reducing index (5.68 as compared to 4.49 in risk reducing technology). These institutional indices are comparable as they all have similar range between 0 and 1. Higher coefficients shows they exerts a considerable impact on growth as one point increase in institutionalized social technologies will leads to 4.60 percent increase in growth rate in model 1.

Conclusion

The results suggest a strong link between institutional quality and economic growth. All three measures of institutional quality significantly and positively affect growth. Moreover our analysis indicate that between the two forms of institutions measured as a sub- indices of institutionalized social technologies, Anti-rent seeking technologies impact growth considerable more than the risk reducing technologies. A similar conclusion is reached by Acemogu and Johnson (2005) who attempted to distinguish between anti-rent seeking institutions and risk-reducing institutions, as they termed them as "property rights" and "contracting" institutions respectively. They found strong support for the importance of anti-rent seeking institutions on economic outcome but In contrast, indicate that the role of risk reducing institutions is more limited. The reason they give to this fact is, in absence of formal risk reducing institutions – contracting institutions, the gap is filled by private alternative institutional arrangement. Like in earlier times when formal institutions of courts and police don't exist or ineffective, people then resort to dwell in groups where contracts are

honoured through informal pressure and risk of expulsion from group. Hence their rights are secured in other ways. In contrast, protection from rent seeking behaviour relates to the relationship between the state and the citizens. When the state have major problems of corruption, inefficiency or no checks on the state, on politicians, and on elites, individuals don't have a level playing fields and adds to uncertainty. In this case, they are also unable to enter into private arrangements to circumvent these problems. The other control variables shows macroeconomic stability, human capital, physical capital and current account balance have significant impact as predicted by theory. The result also confirms conditional convergence as predicted in the modern theories of growth.

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Table 1
Data Sources and Description

	Variable Name	Description	Concept Measured	Source
1	RGDPPC60	Real GDP per Capita in 1960	Initial Factor	Original Source Summers and Heston (1988), Taken by Levine and Renelt (1992)
2	GDPG8803	Average Real GDP Growth (% annual) from 1988 to 2003	Macroeconomic performance	World Development Indicators, World Bank
3	INV8898	Average Public investments as % of GDP from 1988 to 2003	Infrastructure	Original Sources: Guy et al.(1999),Missing data filled in from Easterly et al (1994) and Bruno and Easterly (1998) Taken from: Global Development Network Growth Database.
4	SAV8803	Average Gross domestic savings as % of GDP from 1988 to 2003	Savings	World Development Indicators (various years), World Bank
5	DEBT8803	Average Present Value of Debt as % of GNI from 1988 to 2003	Debt	Global Development Finance and World Development Indicators (various years), World Bank
6	INF8803	Average Inflation, consumer prices (annual %) from 1988 to 2003	Macroeconomic Stability	World Development Indicators (various years), World Bank
7	HDIG9006	Change in Human Development Index from 1990 to 2006	Human Capital	human development report (various years), UNDP
8	CABAL8806	Average Current Account Balance as % of GDP from 1988 to 2006	International Competitiveness	World Economic Outlook (various years), IMF
9	Sci_agg	Index Institutionalized Social Technologies	Institutions	Siddiqui and Ahmed (unpublished)
10	Sii_agg	Aggregate Index of Risk reducing Technologies	Institutions	Siddiqui and Ahmed (unpublished)
11	Ri	Index of AntiRent seeking Technologies	Institutions	Siddiqui and Ahmed (unpublished)

Table 2
Descriptive Statistics

Variable Name	No. of Obs	Minimum	Maximum	Mean	Std. Deviation
sci	141	0.056305	0.933607	0.559089	0.190408
Ri	141	0.057805	0.929479	0.563807	0.192067
Sii	141	0.014987	0.937735	0.554371	0.194626
RGDPPC60	101	0.208	7.38	1.922228	1.798871
INV8898	75	2.311768	20.96169	7.405532	3.81441
SAV8803	135	-21.8591	46.89647	18.24691	10.91243
DEBT8803	95	7.294784	566.9779	68.13708	68.07221
INF8803	130	0.372221	2318.589	84.06305	278.3342
HDI9006	94	-0.028	0.156	0.065521	0.037294
GDPG8803	132	-4.08656	9.099684	2.800371	2.192411
CABAL8806	137	-22.3241	48.34026	-1.86556	7.334458

Table 3

Pearson Correlations

		Sci	Ri	Sii	RGDP PC60	INV 8898	SAV 8803	DEBT 8803	INF8803	HDI9006	GDPG 8803	CABAL 8806
Sci	Coef.	1	.985(**)	.985(**)	.708(**)	0.097	.398(**)	-.330(**)	-.250(**)	-.275(**)	0.109	.227(**)
	N	141	141	141	101	75	135	95	130	94	132	137
Ri	Coef.		1	.940(**)	.716(**)	0.046	.369(**)	-.331(**)	-.244(**)	-.289(**)	0.072	.172(*)
	N		141	141	101	75	135	95	130	94	132	137
Sii	Coef.			1	.684(**)	0.14	.414(**)	-.303(**)	-.248(**)	-.254(*)	0.14	.273(**)
	N			141	101	75	135	95	130	94	132	137
RGDPPC60	Coef.				1	-0.164	.368(**)	-0.188	-0.106	-.388(**)	-0.136	.371(**)
	N				101	66	97	67	96	72	97	98
INV8898	Coef.					1	-0.002	-0.024	-0.047	.288(*)	.245(*)	-0.219
	N					75	74	71	73	52	75	75
SAV8803	Coef.						1	-0.081	-0.156	-0.09	.210(*)	.678(**)
	N						135	94	129	92	130	133
DEBT8803	Coef.							1	.283(**)	-0.067	-.284(**)	-.353(**)
	N							95	91	62	95	95
INF8803	Coef.								1	-0.052	-.363(**)	-.259(**)
	N								130	91	127	130
HDI9006	Coef.									1	.499(**)	-0.106
	N									94	92	94
GDPG8803	Coef.										1	.256(**)
	N										132	132
CABAL8806	Coef.											1
	N											137

**. Corr. is significant at the 0.01 level (2-tailed).
*. Corr. is significant at the 0.05 level (2-tailed).

Spearman's rho Correlations

		Sci	Ri	Sii	RGDPPP C60	INV88 98	SAV8803	DEBT880 3	INF8803	HDI9006	GDPG88 03	CABAL8 806
Sci	Coef.	1	.975(**)	.974(**)	.694(**)	0.147	.421(**)	-0.117	-.472(**)	-.359(**)	0.049	.276(**)
	N	141	141	141	101	75	135	95	130	94	132	137
Ri	Coef.		1	.906(**)	.725(**)	0.067	.400(**)	-0.111	-.401(**)	-.358(**)	0.006	.247(**)
	N		141	141	101	75	135	95	130	94	132	137
Sii	Coef.			1	.630(**)	.231(*)	.422(**)	-0.151	-.533(**)	-.352(**)	0.09	.284(**)
	N			141	101	75	135	95	130	94	132	137
RGDPPC60	Coef.				1	-0.171	.495(**)	-0.101	-.370(**)	-.474(**)	-0.181	.436(**)
	N				101	66	97	67	96	72	97	98
INV8898	Coef.					1	0.006	-0.073	0.02	.307(*)	.231(*)	0.003
	N					75	74	71	73	52	75	75
SAV8803	Coef.						1	-0.049	-.387(**)	-0.15	0.129	.662(**)
	N						135	94	129	92	130	133
DEBT8803	Coef.							1	0.091	-0.207	-.266(**)	-.329(**)
	N							95	91	62	95	95
INF8803	Coef.								1	0.036	-.385(**)	-.399(**)
	N								130	91	127	130
HDI9006	Coef.									1	.543(**)	-0.091
	N									94	92	94
GDPG8803	Coef.										1	.286(**)
	N										132	132
CABAL8806	Coef.											1
	N											137

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 4
Regression Results

Dependent Variable: GDPG8803

Variable	Model 1	Model 2	Model 3
C	-1.180128 -0.872367	-1.446526 -1.078961	-0.687366 -0.501575
SAV8803	0.097844 (3.972231)***	0.094638 (4.06962)***	0.105127 (4.043)***
INF8803	-0.002735 (-5.078299)***	-0.002947 (-5.581566)***	-0.002634 (-4.862613)***
RGCPPC60	-0.416075 (-2.743166)***	-0.499724 (-3.091731)***	-0.332119 (-2.138038)**
DEBT8803	-0.013916 (-3.891616)***	-0.013525 (-3.953439)***	-0.015007 (-4.316956)***
HDI9006	9.657371 (2.617727)**	9.637402 (2.344262)**	9.871756 (2.928749)***
INV8898	0.09075 (2.194805)**	0.103993 (2.423554)**	0.076572 (1.89077)*
CABAL8806	-0.184247 (-2.905519)***	-0.15961 (-2.550105)**	-0.216275 (-3.27437)***
SCI	5.281233 (2.999155)***		
RI		5.806273 (3.047066)***	
SII			4.123679 (2.713007)**
R-squared	0.670971	0.679838	0.653061
Adjusted R-squared	0.593552	0.604506	0.571429
S.E. of regression	1.066646	1.052175	1.095291
Durbin-Watson stat	2.335396	2.2799	2.264863
Sum squared resid	38.68296	37.64047	40.78849
J-statistic	4E-30	2.66E-30	5.53E-30

*** = Significant at the 1% level.
** = Significant at the 5% level.
* = Significant at the 10% level.
Instrument list: All Independent Variables
Included observations: 43 after adjustments

Table 5
List of Countries included in Regression

ALGERIA, ARGENTINA, BANGLADESH, BOLIVIA, BRAZIL, CHILE, COLOMBIA, CONGO, COSTA RICA, COTE D'IVOIRE, DOMINICAN REPUBLIC, ECUADOR, EGYPT, EL SALVADOR, GUATEMALA , GUINEA-BISSAU, HAITI, INDIA, INDONESIA, IRAN, MALAWI, MALAYSIA, MEXICO, MOROCCO, MOZAMBIQUE, NIGERIA, PAKISTAN, PANAMA, PARAGUAY, PERU, PHILIPPINES, SENEGAL, SOUTH AFRICA, SRI LANKA, TANZANIA, THAILAND, TRINIDAD AND TOBAGO, TUNISIA, TURKEY, UGANDA, URUGUAY,VENEZUELA, ZAMBIA