Institutions and economic growth:
A comparative analysis of developing and developed countries based on institutionalized social technologies index

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Abstract. *This paper used index of institutionalized social technologies (lIST) developed by Siddiqui and Ahmed (2018) as a proxy of institutions quality, to analyse their impact on Economic growth. This index was made up of two sub-indices namely Risk reducing technologies and Anti Rent seeking technologies. The cross sectional analysis covered 141 countries. The values are taken as average of the period of 1990 to 2008. The effectiveness of these indices is tested in growth models along with other variables such as inflation, human capital, savings and trade. It also factors in initial conditions to measure signs of convergence. OLS and GMM based methodologies are employed for estimation. The findings are robust and consistent. Institutional quality is positively associated with economic growth suggesting that institutional reforms such as minimizing corruption, strengthen property rights, improving law and order conditions, and enforcing contracts can leads to economic growth. Moreover, the impact of institutions on growth is more pronounces in high income countries, showing institutions are also crucial for sustenance of growth. Among the two forms of institutions, the risk reducing technologies affect economic growth considerably more than anti-rent seeking technologies. The results also confirm conditional convergence as predicted in the modern theories of growth. Overall, these results suggest that effectiveness of institutional reforms would depend upon how these institutions impact growth.*

Keywords: macroeconomic stability, GMM technique, institutionalized social technologies.

JEL Classification: O1; O4; O5; C8.

1. Introduction

Some Theoretical contributions on the impact of institutions on welfare are discussed as under. Schrag and Scotchmer (1993) traced the origin of crime and found that it's not exogenous nor any link found for moral characters. It is endogenously determined by enforcement parameters of the society. Weingast (1995) narrates the historical accounts of institutional change and claims that federalism, a self-govern system with lesser chance of confiscation, played an impressive role in the economic growth of England and United States in 19th and 20th centuries. Murphy, Shleifer and Vishny (1991) showed that Occupational choice between innovative sectors and predatory sectors would depend upon their relative returns to talent.

 In countries where rent seeking has a higher reward for talent like in law sectors, institutions would grow less as compared to countries rewarding high in innovative sectors like engineering. A similar study conducted by Acemoglu (1995) proves that rent-seeking activities create a negative externality on productive activities. Hence agents' relative reward structure is endogenously determined by rent seeking, causing multiple equilibriums, and could let the economy trap in low level steady state equilibrium. In an interesting study, Grossman and Kim (1996) based on inter temporal general equilibrium model, with a predator and a prey dynasties, incorporated institutions in standard growth model. Each dynasty has a choice to allocate inherited wealth in consumption, production or defense and offence. Productive allocation would lead to more wealth but would, at the same time, increase the risk of confiscation of wealth by predators. The choice of prey would be based upon the predator's current wealth. If it is smaller than the prey, then prey chooses production and deter predation. However, wealth redistribution takes place overtime as predator eats prey resources, the risk of expropriation increases to resource allocation in defence. Overtime, all the wealth would be spent in this regard. Inter temporal effect would be similar and prey would continue to allocate wealth to defence even though their property is secure and production became preferable. This way, they accumulate capital more slowly than their previous generations. Magee, Brock and Young (1989) explore the potential of well organized rent seeking groups to exploit poorly-organized groups by influencing irrational state through lobbying. Political parties respond to such efforts increasing its relative benefits. The result would be that the whole economy being captured in unproductive lobbying activities thereby creating an economic black hole. In another entrepreneurial study, Baumol (1993) asserts that entrepreneurs could increase technologies adoption, innovation and enable sustainable growth. However, they sometime tend to misallocate like end mergers and acquisitions or lawsuit that could increase their profits without being productive. Hence institutional arrangement altering the incentive structure is needed for better utilizing entrepreneurial resources. At another place, Baumol (1990) points out that only those firms survive that have informational asymmetries over their competitors and the firms' choice between technological innovations, rent seeking and organized crime would depend upon the relative gains from these asymmetries. Strong institutions decrease the informational asymmetries from rent seeking and organized crime, hence only venue for survival is creating such asymmetries through innovation. Gould and

Gruben (1996) specifically focus on the impact of institutions enforcing intellectual property rights (IPR) protections on economic growth. They find IPR protection reduce imitation probability, increasing its rewards. However, it could also decrease competition making innovation difficult. They argue that imperfect protection. As compared to perfect protection, is more suited for growth. In another study, Cozzi (2001) proves that lower protection of property rights inhibits inventions as it would result in spillover effect before inventor can reap its rents. This could cause other to spend time searching for others' inventions rather making their own.

Olson (1993) created a model showing that any form of government is better than anarchy. He asserts that "Under anarchy, uncoordinated competitive theft by 'roving bandits' destroys the incentive to invest and produce, leaving little for either the population or the bandits. Both can be better off if a bandit sets himself up as a dictator – a 'stationary bandit' who monopolizes and rationalizes theft in the form of taxes".

In that case, he could benefit from taxes that increase in proportion to increase in productivity. Hence it's his interest to provide public goods that influence growth, but if he feels he is likely to be surpassed by others, then he confiscates those assets that value more than their expected rents that he could collect.

An interesting study by Acemoglu and Verdier (1998) points out that there are cost of enforcement. In perfect enforcement, the costs out-weigh the benefits, hence it may be optimal to have an intermediate level of enforcement and allowing some corruption. Society faces a trade-off between investing in production or regulation. However, there could be case free lunch where it is possible to simultaneously reduce corruption by increase in public sector pay, increase investment in private sector by making it more profitable and also improve the allocation of talent. This could be so because, better ex ante property rights through high pays in public sector, would lead to higher profitability and investment in private sector developing about allocation of talent of private sector in productive activities. However, an interesting picture arises when past level of property rights determines the present level of productivities that in turn determine the future level of property rights. This would make initial low property rights countries fall in 'low property right-low investment trap' as their initial low level of property right makes them unproductive. Presently as they invest less in human capital, there would be lesser potential benefits from future improvements in property rights, resulting in voting out those future improvements. Resultantly, developing countries may opt for less effective property rights.

2. Theoretical framework

In this study, the set of economically efficient institutions named "index of institutionalized social technologies" is divided into two brands according to the way they impact growth, based on the theoretical contribution of North (1981). The first is by reducing risk of doing business thus preventing diversion of resources, and the second is by preventing predatory

rent seeking activities, thereby diverting resource toward innovation as the businesses will not need to invest resources in protecting their property rights or earning predatory rents. The following text elaborates these two brands of institutions:

2.1. Risk reducing technologies

The first component in index of institutionalized social technologies is Risk-reducing technologies. Increased risk of expropriation and confiscation of property rights would cause diversion of resources from productive activities to private arrangement in protecting their rights that can be avoided by properly institutionalizing Risk reducing social technologies. In other word, by institutionalizing Risk-reducing social technologies does not mean collectively hiring guards by society proves to be cheaper, it rather means that no guards are required in the first place. Index of risk reducing technologies covers the institutions pertaining to property rights, law and order, and policy stability. Important contributions in this area are by Gould and Gruben (1996); Cozzi (2001); Olson (1965, 1993, 1982); Baumol (1990); North (1990); Greif and Kandel (1995) and Weingast (1995). For theoretical models of weak risk reducing institutions, see (Murphy et al., 1991; Schrag and Scotchmer, 1993; Acemoglu, 1995; Ljungqvist and Sargent, 1995; Grossman and Kim, 1996). Studies such as (Magee et al., 1989; Murphy et al., 1991) explain further how inadequate controls affect growth.

2.2. Anti-rent seeking technologies

Baumol (1990) points out that information asymmetry through rent seeking or organized crime is curbed through strong institutions--so only venue left for competition and dominance is through innovation. Hence in the setting of effective enforcement, these asymmetries will lead to innovation as the only venue left to earn information rents.

The second, and perhaps more important dimension of Institutionalized social technology, is Anti Rent seeking social technology. As shown earlier, the rent-seeking (behaviour) is defined as "the socially costly pursuit of wealth transfers" (Tollison, 1997). Hence its consequences on society are negative as a rent seeker benefits at the expense of others. This in contrast to "creative destruction" where innovation leads to productive rents, rent seeking diverts entrepreneurial efforts and resources from increase in productivity through innovation to unproductive predatory activities by thriving on other people's resources as well as protection against diversion and expropriation. This is termed as "destructive creations" by Mehlum et al. (2003). A vast literature can be found linking entrepreneurship, rent seeking and growth (Murphy et al., 1991; Baumol, 1990, 1993; Acemoglu, 1995; Acemoglu and Verdier, 1998). Rents can be divided into the institutional rents, which cover institutions related to regulatory quality, corruption, and ease of doing business. The role of government regulation has also got conflicting view. Some view regulation as a helping hand (Pigou, 1938). Other views are based on political economics advocating that rent-seeker in government would mould these regulations in their favour, extracting rents (Shleifer and Vishny, 1998).

3. Empirical analysis

In this section, empirical analysis is based on OLS as well as GMM methodologies are conducted to explore the institution growth nexus. This section is organized as follows: Subsection 1) Describes data and Regression specification; 2) Estimation methodology; 3) Explains results.

3.1. Data description and regression specification

Specification of this study 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. 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 empiric literature, such as (Barro, 1991; Mankiw et al., 1992; Leving and Renelt, 1992).

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

where i is the country ϵ_i is the error term. The economic growth Δy_i is measured by GDP per capita Growth in real terms, I_i stands for institutional variables, whereas X_i is the vector of control variables for other determinants of growth. Index of institutionalized social technologies and its two sub indices of Risk reducing technologies and Anti-rent seeking technologies are used as a proxy of institutions. They are in 0 to 1 ranges where higher values indicate better institutional quality. In empirical literature, there is no established pattern of inclusion of control variable. The present study will be using variables pertaining to initial conditions, macroeconomic stability, human capital, savings, and trade

The first control variable describes initial conditions. Testing the model for convergence as described in neoclassical growth models (Solow, 1956) would result if country growth rate exhibits negative relationship with its initial incomes. However, studies done by Barro and Sala-i-Martin (1992) show that convergence is conditional upon other economic variables. We tested the evidence of convergence conditional upon other factors like institutions. In this regard, we used Real GDP per capita PPP in 1990. The expected sign is negative.

Human capital increases the pace of innovation leading to greater growth and productivity hence Education sub index of human development Index is used as its proxy.

Macroeconomic stability is another factor influencing growth. It is measured in this study by GDP deflator. It is found that higher price instability would hamper economic growth, hence possibly having a negative expected sign.

Saving impact growth through increasing investments (Modigliani, 1970, 1990; Maddison, 1992; Carroll and Weil, 1994) hence would show a positive relationship. It is assumed that higher savings precede economic growth. It is represented by Gross Domestic Savings as a percentage of GDP. Trade as a percentage of GDP is used as a proxy for trade

liberalization and openness. It tends to remove price distortions by targeting investment in areas of competitive advantages, increases technology adoption and improves productive and allocative efficiency thereby moving the economy to its production frontiers. This produces a positive impact on growth and development (Jin, 2000; Sukar and Ramakrishna, 2002). Among notable variables not captured in the growth model is fiscal policy indicator, which proved to be statistically insignificant and has, therefore not been included in the regression specification.

Dependent and control variables expect education are taken from World Development Indicators, while education index in taken from UNDP. Except for initial conditions, these variables are expressed in terms of averages from the year 1990 to 2006 depending on the availability of data. Table 1 gives detailed information about the variables and their data source.

3.2. Estimation methodology

We first used simple OLS estimation and then used GMM instrumental estimation to control for endogeneity. In growth models, there might be variables that are endogenous determined from factors within model. For instance, if higher savings leads to growth, higher growth might cause savings. Similarly, higher growth might be the reason for improvement in institutional quality due to Halo effect where people from high growth countries might rate their institutions high. For these cases, instruments are used to control this potential problem of endogeneity. We employed GMM methodology for instrumental variable estimation. GMM methodology is based on the method of moments (Pearson, 1893, 1895) and estimation techniques using instruments (Reiersol, 1941; Sargan, 1958; Hansen, 1982). GMM estimation is based on the selection of parameters that satisfy the theoretical relationship with minimum deviations. It is more robust estimation as compared to other estimation methods like maximum likelihood as it is unaffected to the nature of disturbance distribution. Instrumental variables should satisfy the assumption of exogeneity. To satisfy the conditions, instrumental variables should be correlated with explanatory variable but not with the error term. Meaning they are not impacted by the dependent variable and can only affect the dependent variable through the explanatory variables. Test of over identifying restrictions is used to assess the Validity of this assumption.

In GMM estimation, along with any strictly exogenous variable like initial GDP, initial values of control variables (their respective values in year 1985 for education and 1989 for the rest), other than institutions are taken as instruments. Since institutional indices are not in time series, we used legal origin as instruments. Apart from being exogenous since these systems were spread primarily through conquest and imperialism, legal origin have found to effect institutions. In particular La Porta-LLSV (1998) trace differences in legal origin through to differences in the legal rules covering secured creditors, the efficiency of contract enforcement, and the quality of accounting standards. Table 5 presents regressions to find the impact of legal origin on institutions. Explanatory variables are dummy variables for English, French, German and Socialist legal origin, relative to Scandinavian origin

(which is captured in the constant). We also control for initial level of per capita GDP. The results show that cross country variation in institutions could largely be explained by their legal origin hence they can be used as instruments for institutions in growth regression. The result also shows that institutions are strongest in Scandinavian legal origin, followed by German, British and socialists, French legal tradition tend to have less well developed institutions.

3.3. Estimation results

The impact of institutions on economic growth is tested in two sets of equations. The first set displayed in Table 4 estimates growth functions using OLS methodology on 130 countries while the other set in Table 6 estimates using GMM instrumental variable technique. The results in first set in Table 4 remain consistence.

These results clearly indicate a robust positive impact of institutional index (IIST) on growth. Initial GDP per capita shows expected negative sign and is highly significant. This clearly indicates the sign of convergence as proposed in growth theories. Negative sign shows the countries with lower initial GDP have experienced higher growth rate and possibility of catching up. Among other variables, coefficient of savings also remains positive and significant, clearly showing that saving is instrumental to growth as it increases capital accumulation and investments. Inflation with expected negative sign is highly significant at a 1% level in all models. This suggests that macroeconomic instability has a negative effect on economic growth. Hence, pursuing policies of inflation financed growth might not be fruitful in long run. Human capital, measured by education, was found to be statistically significant and positive. This indicates investing in human capital would produce a positive impact on growth, as it increases workers' quality and ultimately increase productivity.

Equations 1-3 in Table 4 estimates the impact of institutional quality on economic growth. Three indices tested separately for institutional quality. This includes composite index of institutionalized social technology (IIST) and two of its sub indices are index of risk reducing technologies and rent seeking technologies. All three are positive and highly significant at a 1% level. In a simulation, we included all three indices in one equation. It was witnessed that when used with other institutional variables, their significance decreased considerably probably because of high multicollinearity among these variables. Due to this fact, we used them separately in three equations. This can also be witnessed by extremely high correlation coefficients among institutional variables of about 0.97, indicating that different institutional measures have high common factors on which these measures are dependent. Overall, these finding prove robust relationship between institutions and growth. Their estimates are large showing that marginal improvement in institutional qualities would produce huge impact on growth. Among institutions, coefficient of risk reducing index (4.62) is comparatively higher and more significant than the coefficient of anti rent seeking index (2.72) this suggests that risk reducing institutions produce comparatively larger impact on growth. However these results contradict earlier results by Acemoglu and Johnson (2005) that proves anti-rent seeking institutions could

impact growth more. These institutional indices are comparable as they all fall within a similar range, i.e., between 0 and 1.

Other three equations from 4-6 in Table 4 test the regional effect of institutions on economic growth. Equation 4-6 partitioned institutions indices into High income countries and Developing countries using dummy variables. Institutions index are multiplies by one if the country belongs to high income group and zero if not. Second variable does the same for nation belonging to developing countries i.e. multiply by one if they are developing nations and zero if they are not.

These regressions clearly show that the magnitude of coefficients for high income countries is larger and more significant. Anti rent seeking index became insignificant for developing countries. This shows that when everything else remains the same, institutions would impact economic growth more in high income countries as compared to developing countries. This means good quality institutional are not only instrumental for making nations prosper, it also be able to sustain growth in long run as high income countries with better institutions growth comparatively more.

Regression results in Table 6 are estimated using GMM methodology to remove biases caused by endogeneity. Models 10-12 test using basic information sets. Dependent variable GDP per capita is regressed with institutions along with saving and initial conditions as independent variables. These results are consistent with our earlier findings. Institutions produce positive and significant impact on growth. These results also remain consistence in Model 13-15 where certain other variables like trade, Inflation and education are added to basic model.

Test of over identifying restrictions (OID) is performed to assess the validity of instruments. Under the null hypothesis that the over identifying restrictions are satisfied. P-value of OID show fails to rejects null hypotheses hence instruments are appropriate and results are credible.

These results in Tables 4 and 6 are also seemed to be robust to serial correlation. Different sets on countries are used in different regression from 130 countries used in OLS to 78 countries using GMM full information set.

4. Conclusion

This paper used index of institutionalized social technologies (IIST) developed by Siddiqui and Ahmed (2018) as a proxy of institutions quality, to analyse their impact on Economic growth. This index was made up of two sub-indices namely Risk reducing technologies and Anti Rent seeking technologies. The cross sectional analysis covered 141 countries. The values are taken as average of the period of 1990 to 2008. The effectiveness of these indices is tested in growth models along with other variables such as inflation, human capital, savings and trade. It also factors in initial conditions to measure signs of convergence. OLS and GMM based methodologies are employed for estimation. The findings are robust and consistent. Institutional quality is positively associated with economic growth suggesting that

institutional reforms such as minimizing corruption, strengthen property rights, improving law and order conditions, and enforcing contracts can leads to economic growth. Moreover, the impact of institutions on growth is more pronounces in high income countries, showing institutions are also crucial for sustenance of growth. Among the two forms of institutions, the risk reducing technologies affect economic growth considerably more than anti-rent seeking technologies. This clearly contradicts the earlier result of Acemoglu and Johnson (2005) that proves otherwise. The other control variables showed that human capital, physical capital and international trade have significant impact as predicted by theory. The results also confirm conditional convergence as predicted in the modern theories of growth. Overall, these results suggest that effectiveness of institutional reforms would depend upon how these institutions impact growth.

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Table 1. *Estimation variables' data sources and description*

	Variable Name	Description	Concept Measured	Coverage	Source
1	RGDPPCG	GDP per capita growth (annual %). Annual percentage growth rate of GDP per capita based on constant local currency. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies. (code-NY.GDP.PCAP.KD.ZG)	Economic Performance	1990-2006	World Development Indicators-WDI (2008)
2	RGDPPC90	GDP per capita, PPP (current international $). GDP is gross domestic product converted to international dollars using purchasing power parity rates. (code-NY.GDP.PCAP.PP.CD)	Convergence	1990	
3	SAVING	Gross domestic savings (% of GDP). Gross domestic savings are calculated as GDP less final consumption expenditure (code-NY.GDS.TOTL.ZS)	Saving and Investment	1990-2006	
4	INFLATION	GDP deflator (base year varies by country). The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency. (code-NY.GDP.DEFL.ZS)	Macro-economic Stability	1990-2006	
5	TRADE	Trade (% of GDP). Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. (code-NE.TRD.GNFS.ZS)	Openness	1990-2006	
6	EDUCATION	Education index (HDI).	Human Capital	1990-2007	Human Development Index-HDI (various years)
7	IIST	Index Institutionalized Social Technologies	Institutions		Authors' own calculations
8	Sii	Index of Risk reducing Technologies	Institutions		
9	Ri	Index of Anti-Rent seeking Technologies	Institutions		

Table 1. *Descriptive statistics*

	RGDPPCG	IIST	RI	SII	Education	Saving	Inflation	RGDPPC90	Trade
Mean	1.976272	0.55797	0.566305	0.549636	0.779176	18.88961	3.97E+11	6989.239	81.48656
Median	1.846429	0.521512	0.543847	0.516084	0.848	18.98249	108.4761	4087.271	70.26988
Maximum	26.07452	0.924078	0.939835	0.918515	0.988	54.82545	5.51E+13	35780.89	417.448
Minimum	-4.97836	0.058482	0.059412	0.012869	0.216	-14.6853	34.79983	245.224	3.588676
Std. Dev.	2.765753	0.186677	0.19497	0.186962	0.19022	12.11772	4.68E+12	7380.869	51.37435
Skewness	4.704483	0.059955	-0.055791	0.097168	-1.133895	0.130048	11.66221	1.388165	2.981782
Kurtosis	43.07789	2.666081	2.644591	2.600122	3.364363	3.398578	137.0072	4.532028	17.2212
Observations	139	141	141	141	136	137	139	130	137

Table 2. *Correlation coefficient matrix*

	RGDPPCG	Education	Saving	Inflation	RGDPPC90	Trade	Sii	Ri	IIST
RGDPPCG	1								
Education	0.2826	1							
Saving	0.2818	0.3986	1						
Inflation	-0.3339	-0.0956	-0.0928	1					
RGDPPC90	0.0521	0.5938	0.4960	-0.0784	1				
Trade	0.1680	0.2620	0.3867	-0.0546	0.2723	1			
Sii	0.2789	0.5808	0.3776	-0.1644	0.7707	0.3393	1		
Ri	0.2418	0.6567	0.2909	-0.1715	0.7010	0.2565	0.9097	1	
IIST	0.2662	0.6337	0.3416	-0.1719	0.7526	0.3044	0.9766	0.9777	1

Table 4. *Institutions and growth: OLS regression, 1990-2006*

Dependent Variable: RGDPPCG						
Model	1	2	3	4	5	6
Institutions	IIST	Ri	Sii	IIST	Ri	Sii
C	-1.925718	-1.453419	-2.270955	-1.789766	-1.268473	-2.169534
	(0.0084)	(0.0395)	(0.0022)	(0.0187)	(0.0806)	(0.0049)
Institutions	4.008087	2.722701	4.620821			
	(0.0021)	(0.0254)	(0.0003)			
Institutions × High Income Countries				4.10463	2.924967	4.728385
				(0.0018)	(0.0178)	(0.0002)
Institutions × Dev. countries				3.558966	2.059017	4.312124
				(0.0158)	(0.1321)	(0.0022)
Savings	0.048282	0.04861	0.045576	0.050358	0.051749	0.047305
	(0.0006)	(0.0008)	(0.0009)	(0.0005)	(0.0005)	(0.0009)
Inflation	-9.71E-14	-1.01E-13	-9.57E-14	-9.91E-14	-1.04E-13	-9.7E-14
	(0.0009)	(0.0006)	(0.0008)	(0.0007)	(0.0005)	(0.0008)
RGDPPC90	-0.000131	-0.000108	-0.000147	-0.000148	-0.000137	-0.00016
	(0.0000)	(0.0003)	(0.0000)	(0.0004)	(0.0009)	(0.0002)
Education	1.927196	2.014865	2.196849	2.053523	2.245268	2.264463
	(0.0422)	(0.0442)	(0.0146)	(0.0346)	(0.0287)	(0.0132)
P-values of t-statistics in parentheses.						
Adj. R-squared	0.28026	0.28269	0.30280	0.27687	0.25438	0.29853
F-statistic	11.04647	9.77342	12.20527	9.23193	8.33519	10.14997
Durbin-Watson stat	1.98346	1.96373	1.99150	1.98200	1.96527	1.99034
countries included:	130	130	130	130	130	130

Table 5. *Legal origin and IIST, 1990-08*

Model	7	8	9
Dependent Variable:	IIST	Ri	Sii
C	0.619295	0.642296	0.596294
	(0.0000)	(0.0000)	(0.0000)
British	-0.140392	-0.149957	-0.130827
	(0.0142)	(0.0202)	(0.0197)
French	-0.182705	-0.188637	-0.176774
	(0.0017)	(0.0039)	(0.0019)
German	-0.046424	-0.053032	-0.039816
	(0.5166)	(0.5117)	(0.5705)
Socialist	-0.160933	-0.170671	-0.151195
	(0.0091)	(0.0142)	(0.0124)
RGDPPC90	0.000015	0.0000142	0.0000158
	(0.0000)	(0.0000)	(0.0000)
P-values of t-statistics in parentheses.			
Adj. R-squared	0.592213	0.531344	0.634634
F-statistic	37.01602	26.98349	41.34019
DW stat.	2.017539	2.003731	2.065616
countries incl:	125	125	125
British = English legal origin, French = Napoleonic legal origin.			
German = German legal origin, Socialist = Socialist legal origin.			
Scandinavian legal origin is the omitted category.			

Table 6. *Institutions and growth: GMM (Generalized Method of Moments) regression, 1990-2006*

Dependent Variable: RGDPPCG						
Model	10	11	12	13	14	15
Information set	BASIC	BASIC	BASIC	FULL	FULL	FULL
Institutions	IIST	Ri	Sii	IIST	Ri	Sii
C	-0.585179	-0.581702	-0.582298	-1.452353	-1.412784	-1.48587
	(0.4892)	*(0.5012)*	*(0.4833)*	*(0.0911)*	*(0.099)*	*(0.0861)*
Institutions	2.797519	2.651283	2.954003	3.020999	3.003407	3.036547
	(0.0718)	*(0.0803)*	*(0.0655)*	*(0.0392)*	*(0.0507)*	*(0.0304)*
RGDPPC90	-0.0000843	-0.0000801	-0.0000888	-0.000133	-0.000126	-0.00014
	(0.034)	*(0.0362)*	*(0.0328)*	*(0.0000)*	*(0.0000)*	*(0.0000)*
Saving	0.068487	0.069614	0.067061	0.060748	0.063929	0.057288
	(0.0052)	*(0.0051)*	*(0.0055)*	*(0.0217)*	*(0.0188)*	*(0.0266)*
Trade				0.002694	0.003757	0.001611
				(0.4344)	*(0.2922)*	*(0.6368)*
Inflation				-0.0000164	-0.0000154	-0.0000174
				(0.1976)	*(0.2555)*	*(0.1455)*
Education				1.661368	1.311524	2.017376
				(0.1615)	*(0.3326)*	*(0.0573)*
P-values of t-statistics in parentheses.						
Adj. R-squared	0.220166	0.206253	0.228819	0.282594	0.239173	0.318226
DW statistics	1.790544	1.795591	1.789118	1.699283	1.705042	1.704487
J-statistic	0.034298	0.035299	0.033022	0.069047	0.069047	0.074395
Countries incl.:	114	114	114	78	78	78
OID	3.910022483	4.02409	3.7644833	5.3856948	5.000794	5.80279492
OID (p-value, 3df)	*(0.27134)*	*(0.25888)*	*(0.28804)*	*(0.14564)*	*(0.17174)*	*(0.12161)*
Instrument are Initial level of the explanatory variables (year 1989) except institutions and legal origin dummy variables.						